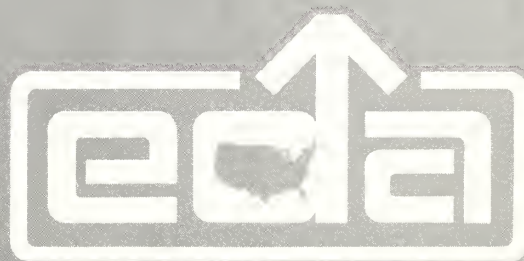A UNITED STATES
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The Economic Development Administration's

Business Loan Program

AN EVALUATION

U.S.
DEPARTMENT
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Administration

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AN EVALUATION OF THE

ECONOMIC DEVELOPMENT ADMINISTRATION'S

BUSINESS LOAN PROGRAM

prepared by

Chilton Research Services
Philadelphia, Pennsylvania

and

CONSAD Research Corporation
Pittsburgh, Pennsylvania

for the

Economic Development Administration

This economic research study was accomplished by
professional consultants under contract with the
Economic Development Administration. The statements,
findings, conclusions, recommendations, and other
data in this report are solely those of the contractors
and do not necessarily reflect the views of the
Economic Development Administration.

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U.S. DEPARTMENT OF COMMERCE
Maurice H. Stans, Secretary

Rocco C. Siciliano, Under Secretary

Robert A. Podesta, Assistant Secretary
for Economic Development

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I. INTRODUCTION

A. Objective and Method of This Study

It is the legislated goal of the Economic Development Administration to reduce unemployment in areas (counties) where the unemployment rate is in excess of six percent and to reduce poverty in areas where the median family income is less than 40 percent of the national average. In pursuit of those goals, EDA administers what is essentially a four-pronged action program: loans and grants for public works investments, business loans, planning grants, and technical assistance programs. This report presents an evaluation of the economic impacts, the business loan program, as jointly conducted by Chilton Research Services of Philadelphia and CONSAD Research Corporation of Pittsburgh.

The objective of this study was to evaluate, in terms of its economic impacts on depressed areas, the Economic Development Administration's business loan program. More specifically, this study has sought to determine:

- the extent of program benefits;

- the factors underlying program success;

- the incidence of program benefits.

The framework in which the findings of this study are analyzed is that of benefit-cost analysis. This framework has been used in the past by EDA to evaluate its business loan program; but, due to the small number of loan recipients sampled in past studies and to the fact that probability sampling was not employed, the reliability in these past studies has not been known. This study, conducted as it was among a probability sample of loan recipients, corrects these shortcomings by obtaining a number of interviews large enough to permit meaningful statistical analysis.

Statistical methods, both in the data-collection phase and in the analysis, were used where appropriate. In addition, multiplier analysis and Markovian incidence analysis were undertaken.

B. Data Collection

In developing a substantial data base, information was obtained from employees of firms receiving EDA business loans through the medium of a self-administered questionnaire. In addition, opinions and attitudes of leaders of the communities in which the firms located were obtained through the Chilton Research Services TeleCentral system, a battery of Wide Area Telephone Services (WATS) lines at the Chilton Research Services main office in Philadelphia.

1. Questionnaire

The employee questionnaire used in this study was based on the questionnaire submitted by EDA. The questionnaire was reviewed in meetings with representatives of the Economic Development Administration, Chilton Research Services, and CONSAD Research Corporation and with Dr. William Miernyk of the University of West Virginia. The questionnaire was formatted by Chilton Research Services. Bureau of Budget approval of this questionnaire was obtained (Bureau of Budget approval number 41-S-69015), and the questionnaire was reproduced through the facilities of the Chilton Company.

The questionnaire used for the opinion leaders phase of the study was developed in similar meetings and was formatted and copies produced in the same manner.

2. Sample Design

The universe for this study consisted of all ARA-EDA loans granted prior to June, 1968, and in the amounts of $100,000 or more. Of all ARA and EDA loans, this represents approximately 97.6 percent of the total dollars granted and 73.0 percent of the number of loans. (See Table 1)

A systematic random sample, based on every n^{th} selection, was drawn for this study. A random start was made and thereafter every fourth name was selected from the list of ARA-EDA business loans

Table 1

ARA - EDA Business Loan Universe Distribution

	Distribution by:	
	Dollar Volume	Number of Firms
	%	%
Under $50,000	.6	13.1
$50,000 - $99,999	1.8	13.9
$100,000 - $149,999	2.5	11.1
$150,000 - $199,999	2.7	8.7
$200,000 - $499,999	16.3	27.2
$500,000 - $999,999	14.9	11.3
$1,000,000 and Over	61.2	14.7
	100.0	100.0

provided by EDA. From this design, 128 business loans were selected.
Of those, 66 loans were eliminated because:

- the loan was granted after June, 1968;

- the loan was less than $100,000;

- the firm to which the loan was granted was either out of business or in the process of being liquidated; and

- the firm name and location was duplicated in the sample.

A total of 62 firms was therefore eligible for data collection, representing all firms receiving ARA-EDA business loans in the amount of $100,000 or more, prior to June, 1968.

3. Completion Rate

In order to gain as high a questionnaire-completion rate as possible, the following general procedures were employed:

a. The Economic Development Administration notified its local offices of the study and identified the contractor and the local companies which would be contracted.

b. A letter from EDA's Washington office went to a principal in each of the sampled firms, notifying them of the nature of the study and the importance of their cooperation and identified the contractor. They were also informed that a senior staff member of Chilton Research Services would telephone to set up an appointment.

c. Senior members of Chilton Research Services telephoned each sample firm to request cooperation and to discuss the procedure to be used in contacting and interviewing the employees.

d. Interviewers in the field were then told of the procedure that was to be used for each plant they were to visit.

Most firms requested that the questionnaire be sent to them for distribution to the employees. The Chilton interviewer would then call at a later date, pick up the questionnaires, and review them for completeness while at the plant. Some firms requested that the interviewers distribute the questionnaires one day and call back on a different day. Still others, particularly the firms with a limited number of employees, were willing to bring all the employees together in one room, and to have the interviewer distribute the questionnaires and collect and review them, all in one operation.

This flexible approach led to 76.9 percent cooperation among the eligible firms in the sample, ten companies of the 62 having been rated ineligible, as Table 2 shows.

As to completion rate among eligible employees within the firms, 73.3 percent of the employees of cooperating firms filled out the questionnaire. (See Table 3).

Table 2

Completion Rate of Sample Firms

	Total Sample	
	Number	Percent
Firms Selected	62	
Ineligible Firms:		
Seasonal employment, employees not available at time of survey;	4	
Funds not disbursed, cancelled by EDA;	4	
Company on strike - union problems	2	
Eligible Firms:	52	(100.0)
Firms cooperating in the sample;	40	76.9
Waiting for approval from headquarters or firms unable to complete within deadline;	5	9.6
Refused cooperation;	5	9.6
Other	2	3.9

Table 3

Completion Rate of Employees in Cooperating Firms

Number of eligible employees	2,847
Number of employees cooperating	2,143
Proportion of employees cooperating	75.3%

4. Opinions of Leaders

Names of community leaders were obtained by interviewers while calling on the sampled firms. These names were sent to Chilton Research Services Philadelphia office and sampled. One hundred completed interviews were obtained in the 40 communities in which the cooperating firms were located.

5. Timing

The employee self-administered questionnaire was mailed to the sample firms starting April 7, 1969. All questionnaires used on this study were received by Chilton Research Services on or before May 14, 1969.

Interviewing for the Opinion Leaders questionnaire began on May 5, 1969, and was completed May 13, 1969.

C. Analysis

Upon completion of the survey by Chilton Research Services, the survey data was transmitted to CONSAD Research Corporation for analysis. The objectives of the analysis were to determine:

- the magnitude of direct program impacts in terms of employment and income generation;

- the incidence of program impacts in terms of goal attainment, including the distribution of jobs to the unemployed and under-employed, and of income to the poor;

- the characteristics of those who benefitted;

- the factors underlying the likelihood and magnitude of program success;

- the indirect benefits generated by the program through the multiplier processes of local economies;

- the value of the program in meeting social goals in terms of benefits and costs; and

- the size of loan estimated to generate maximum net program benefits.

1. The Magnitude and Incidence of Direct Impacts.

This analysis required tabulation of the completed questionnaire to determine the number of jobs and the magnitude of income created by the program. Those impacts were disaggregated by prior status of the employees to determine the extent to which the loan program has reached the unemployed and the poor, as well as in-migrants, in-commuters, and new labor force entrants. They were then further disaggregated to identify the demo-graphic and socio-economic characteristics of each of these incidence

groups. The results are presented in Chapters II and III.

2. Factors Underlying Program Success.

The collection of a sizeable data base on program impacts provided the study with an opportunity to apply multivariate statistical techniques for the purpose of identifying the factors most closely associated with program success. However, this necessitated that measures be obtained on the socio-economic characteristics of the counties in which the firms are located, attributes of the firms themselves and of the financing they received.

Factors most associated with the probability of success, or its complement, the likelihood of default, were analyzed via multiple regression and discriminant analysis. The analysis of the factors most closely associated with the magnitude of success as measured by the number of jobs and by the income generated in each loan-recipient firm made use of multiple regression analysis. The results are described in Chapter V.

3. Indirect Impacts.

Income earned by the employees of the EDA loan-recipient firm is either saved, or is spent in the local area or outside the area. To the extent that this income is spent locally, it generates additional income each time it circulates through local hands. The benefits of this effect must be attributed to the EDA loan program. An effort to estimate these indirect impacts required the calculation of an income multiplier.

Since it was seen as necessary to the evaluation to identify impacts by incidence group, rather than merely in the aggregate, an incidence multiplier was developed that could provide estimates of the indirect income impacts to low, middle, and high income wage earners. The development of this "incidence multiplier model" is described in Appendix A.

The "incidence multiplier" was developed out of an a priori formulation of the rural income circulation process, in conjunction with knowledge of the available data. As such, it was necessary to make the simplifying assumption that interindustry transactions could safely be ignored. However, for purposes of obtaining an accurate estimate of the aggregate indirect impacts in the loan-recipient counties, it is clear that the incidence multiplier would understate the actual effect. For this reason, an aggregate econometric multiplier model was developed, and is described in Appendix B.

4. Evaluation of the EDA Loan Program.

A number of criteria could be stipulated for purposes of evaluating the EDA loan program. The more traditional of these is the requirement that the benefit-cost ratios based upon the current discounted values of future income and cost streams exceed unity, where income is taken either as (a) the aggregate income or (b) the increased earnings attributed to the loan program. Two additional bases for evaluation have been suggested,

in which the achievement of stipulated goals be achieved in greater magnitude, per dollar cost, than alternative programs. One way of measuring goal achievement is the discounted income stream into an infinite future accruing to the poor, and another is the number of individuals taken off unemployment or out of poverty. All four bases for evaluation were undertaken, and the analyses are presented in Chapter VI.

5. Optimal Loan Size.

The question arises as to whether a policy of providing much larger loans would contribute more to goal achievement than smaller loans. Although an initial attempt was made to provide clues to this problem in Chapter V in the analysis of the determinants of loan success, the complexity of the analysis required a more extensive treatment than could be undertaken in that chapter. Therefore, a more formal formulation of the problem, together with an effort to identify the correct functional form relating size of loan to program benefits, was undertaken. Applying regression analysis and a simple optimization technique, an attempt was made to estimate the optimal loan size that would maximize the net benefit generated by each loan. This analysis is described in Chapter VII.

II - SUMMARY OF FINDINGS AND CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

Before summarizing the results of the study, three preliminary remarks are in order. First, no claim is made that the sample of firms is representative of the present portfolio of EDA business loans. As stated earlier, the universe consisted of ARA and EDA loans in excess of $100,000 and approved prior to June, 1968.* Over the past several months there has been a shift in the agency's lending policy towards loans larger in absolute amount but smaller as a percent of total project cost than those examined in this study. Hence, to the extent that benefits per dollar of EDA loans increase with the size of loan, as is suggested by the results of this study, the economic impact of the current EDA loan program will be underestimated by these findings.

Second, as in all investigations involving surveys and interviews, the question of what to do about non-respondents arises. What has been done here, and it is virtually all that can be done, is to assume that the distribution of attributes is the same for non-respondents as for respondents. Statistical findings presented in this section and elsewhere in the report reflect that assumption.

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*June '68 was chosen as the cut-off in an effort to capture just permanent impacts rather than some that may only be immediate.

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Finally, despite efforts to the contrary, a gray area inevitably exists

between the so-called "hard" findings of a study and interpretations of

those findings, i.e., what are generally thought of as conclusions. For

this summary, it was decided that the quantitative results of the survey

and inferences drawn from statistical analysis of these data would be

labeled "Findings," and all other interpretations, which relate mainly to

causal relationships and policy implications, will be called "Conclusions."

A. Findings

A sample of 40 firms receiving $23,180,000 in ARA-EDA loans
during the period 1962-1967 showed that:

1. 1817 jobs were created, of which 68% went to individuals
   who were previously employed full time, 9% to those
   employed part time, 12% to new labor force entrants,
   and 11% to people who were formerly unemployed. The
   "cost per job," i.e., amount of EDA loans divided by
   the number of jobs created, was $12,757.

2. the average increase in individual earnings was $1,393
   per employee.

3. 425 people, or 23%, went from below to above the poverty
   level income ($4,000 per year), but 164, or 9%, went
   from above to below $4,000 per year.

4. the number of people taken off the unemployment or
   poverty rolls (and in some cases, both) as a direct
   result of the new jobs was 346, or 19%.

-- The type of individual most likely to obtain a job in the loan recipient

firms was a family man, under 35 years of age, white, and a high school

graduate. He lives in the same county and within six miles of his job, and

has lived in that county for at least nine years. He is a semi-skilled worker who is employed full time, has no additional jobs, and earns under $100 per week.

-- Of special interest is that:

1. Over half of those who were previously categorized as poor or unemployed were women.

2. Non-white employees are much more likely to have previously been unemployed, part time or farm workers.

3. Almost two-thirds of the previously unemployed were not heads of households.

-- Factors associated with the likelihood of a firm's success, i.e., the probability that it will remain in existence, include:

1. its being located in a relatively large town.

2. its being located in a town with low manufacturing wages and a low growth rate.

3. the fact that it has received a loan that is large relative to the ARA-EDA average.

-- Factors associated with the magnitude of success, measured in terms of pre-loan to post-loan change in employment or total wages paid, given that the firm remains in existence, include:

1. larger loans.

2. better educated labor force.

3. location in towns having a larger proportion of the labor force employed in manufacturing occupations.

4. the fact that the firm is located in a town that is small relative to the others in the sample and characterized by higher levels of out-migration and poverty, and lower growth rates.

5. the firm is engaged in manufacturing, and the quality of its labor force is not a critical factor.

-- An analysis of the most appropriate loan size that should be provided-- most appropriate from the standpoint of generating the highest net benefit from the program--showed that even with the most conservative approach, loans in excess of $2 million each are indicated. This is four times as great as the average loan disbursed during the study period, 1962-1967.

B. Conclusions

In terms of performance, it was found that the loan program generated aggregate benefits far in excess of its cost. When benefits are considered applicable to all recipients regardless of prior income or employment status, benefit-cost ratios were found without exception to be greater than unity. Even when benefits are viewed as applicable only to economically distressed individuals, the program directly or indirectly (as a result of the multiplier process) caused 520 people to be removed either from the poverty or unemployment rolls, at a cost ranging from $17,500 to $25,000 per person. This cost is undoubtedly less than the cost to society of letting these individuals (and in many cases, their dependents also) remain unemployed or in poverty over their lifetimes.

On the basis of the finding that 69 percent of the direct increase in income was incident to individuals who are not poor, and from the analysis of the magnitude and incidence of multiplier effects, it is concluded that a program designed to generate economic impacts by stimulating economic development must generate an impact far in excess of that needed to attain goals relating strictly to poverty and unemployment.

Through statistical analysis of the factors underlying the success of firms and the program itself, it was found that greater impacts were obtained in regions having better quality manufacturing labor, but undergoing economic decline as indicated by out-migration and negative growth rates. Evidently, the reduction in the competition for a good labor force results in lower wage rates, which gives the EDA assisted industry an additional, and effective, competitive advantage.

Finally, the study suggests that the recent trend in EDA toward larger loans is a step in the right direction. In fact, the evidence indicated that loans in excess of $2.5 million each would maximize net program benefits. However, the results relating to EDA's share of total project cost were neither as favorable nor as conclusive with respect to current policy. The variable

representing EDA's share consistently bore a _positive_ relationship with measures of success of the loans. This finding is inconsistent with the hypothesis underlying the current policy of reducing the relative size of the agency's participation, but it should be noted that the variable failed to pass tests of statistical significance. Two--and obviously conflicting--explanations can be given to this. The first is that the result is a valid one, and it is due to the fact that the effects of the higher cost of capital obtained from sources other than EDA more than offset the "leverage" which the agency realizes by reducing its degree of participation. Second, is the argument that projects being financed under the new policy are qualitatively different from those included in the sample, and the results of the statistical analysis are therefore not applicable to this issue. The authors of this report take a neutral position with respect to these two points of view.

C.   Recommendations for Further Research

An analysis of the type described in this study, if properly designed, can make use of a relatively limited budget to provide answers to a number of relevant questions. But budgets do create limitations, and study designs always seem to have left some stones unturned, especially when they are viewed in retrospect. Therefore, several recommendations for future work will be made.

The analysis of income impacts would be made more informative by broadening the survey to organize income data around the family rather than the individual. Although such a study would be more costly and difficult to administer, it would be valuable to know whether the added earnings of an individual, who remains poor, nevertheless contributes enough to the family of which he is a member to raise it out of poverty.

The musical-chairs effect, discussed briefly below and in more detail in Chapter VI, remains uncovered. According to the optimistic view of this effect, although 70 percent of the jobs created in loan-recipient firms went to persons who were previously employed full time, a certain portion of the jobs released by these individuals will be obtained by the poor and unemployed. The remainder being obtained by those previously employed full time, who release jobs, a certain portion of which . . . and so on. If this view is correct, the program will yield several times more benefits than if the effect does not operate at all. If, however, a larger portion of the jobs released by the previously employed are not filled due to the upward pressure on local wages caused by the reduced labor supply (See Chapter VI), then the musical-chairs effect will be relatively small.

What is needed is an in-depth study, perhaps a case study, tracing whether the jobs released by "job-switchers" were filled either by the unemployed, in-migrants, new entrants, by other job-switchers, or went unfilled, resulting in a contraction of the local economy that did not receive EDA aid.

A larger base of data on disbursed loans and their correlates, extending to 75-100 observations, is needed to improve the statistical analyses attempted in Chapter V and VII. The data would describe the employment level of each firm and the total wage bill, size of loan and a more detailed characterization of the firm, as well as locational characteristics. This information could be gathered largely by area representatives in local field offices, and without requiring survey techniques.

The analysis of optimal loan size in Chapter VII is highly dependent upon the correct identification of the nature of the mathematical relationship between the size of loan and the magnitude of benefits generated by the loan-recipient firm. Further research is needed on the exact form of this relationship. In addition, other variables relating to the magnitude of impact should be included. To meet these analytic requirements, it will be necessary to perform a more intensive analysis, employing more advanced statistical methods, and making use of a considerably larger sample.

III. THE DIRECT ECONOMIC EFFECTS OF THE EDA BUSINESS LOAN
PROGRAM

This chapter is to describe and analyze the direct economic effects

generated by 40 firms as a result of EDA and ARA loans to these firms. The

analysis included changes in employment status and income status. Only

changes in the status of new employees will be considered in this chapter.

In order to define changes which have the most relevance for EDA, special

emphasis is placed on three groups; the formerly unemployed, the poor, and

heads of households. These categories are not mutually exclusive and an ef-

fort was made to determine the extent of overlapping. For this study, an annual

income of less than $4000 for an individual employee was considered a

poverty-level income.*

The following summarized the direct impacts of $23, 180, 000 in

loans disbursed by ARA and EDA to a sample of 40 firms:

1.   1,817 people gained jobs from EDA loan-recipient firms after
      the loans were received. 68% of these employees had previously
      been employed full time. 23% had been unemployed or under-
      employed (Table 1).

2.   6% of the new employees had migrated into the county in which the
      EDA firm was located. 14% of the new employees were currently
      in-commuters and lived in nearby counties (Table 2).

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    * The decision to focus upon individuals earning under $4000 per year raises
a question as to whether the low income wage earners should be considered as
poor. Although poverty income is properly discussed on a family or household
basis rather than on an individual basis, the employee survey reported in this
study was taken at place of work rather than at place of residence, making
income estimation on a family basis considerably more complicated. In
addition an annual income of $4,000 rather than $3,500 was chosen as the
cutoff point since the latter would have surpassed the large number of effects
reported in employees in the low income range between $3,000 and $4,000.

3.	Among those hired by EDA loan-recipient firms, the annual
increase in income has averaged $1,393 per employee. Because
of this additional income, there was a net increase of 315 em-
ployees with incomes above poverty level (Table 3).

4.	The number of people taken off the poverty or unemployment rolls
as a direct result of the new jobs were 346 (19% of the total)
(Table 4).

A. Employment Impacts

Data was analyzed for 40 loan-recipient firms with a total of 2,848

employees. Of these, 1,817 were considered to be new employees (hired

after the date of approval of an EDA or ARA loan).*

Table 5 shows changes in employment and residence status among

these new employees. 58 of the 1,031 employees hired before the date of the

loan worked for companies who received EDA loans to prevent them from go-

ing bankrupt and, on this, could have been, but were not, included in the

measure of success of the program.

It is to be noted that 68% of the new employees had previously been

employed full time in another job. This high proportion is over twice that

expected on the basis of the Miernyk study (which reported that 34% of its

sample had been fully or partially employed).** However, like the

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* No information was available on how many of these employees
were hired to fill positions in existence before the EDA loan.

** Evaluation of ARA-EDA Loan Program, Office of Economic Research,
Economic Development Administration, November, 1968, page 2. It should
be noted, however, that the low proportion reported in the Miernyk study
occurred during a period when the national unemployment rate was considerably
higher -- 5.6% versus the current 4%.

Miernyk study, the survey results showed that many of the previously unemployed had not been members of the labor force and that most of these new labor force entrants were women (See Chapter III).

Former part-time employees (171) make up about 10% of the total of new employees, and only 14 of these were still employed part time. Almost all these employees responded that, while they had been working part time before, they did not prefer to work part time. They were, therefore, considered underemployed.

Data on new labor force entrants reinforces the belief that new employment opportunities must greatly exceed employment targets for the unemployed and underemployed. The number of new labor force entrants (216) is larger than the number of formerly unemployed (196). However, about one-fourth of the new labor force entrants classified themselves as heads of households who probably (a) would have entered the labor force in the near future or (b) were labor force dropouts who had been unemployed for a long period of time and were no longer actively looking for work.

Almost 80% of the heads of households are now employed full time and had been employed full time. Former unemployed and underemployed persons made up 14% of the heads of households, while almost 29% of the non-heads of households hired had been unemployed or underemployed (See Tables 6 and 7).

Most (86%) of the new employees were county residents. About 7% of these were in-migrants who had not been living in this county before starting their present job. About 1% of the new employees were in-migrants who had moved to nearby counties and were currently in-commuters (See Table 2).

B. Income Impacts

The following discussion deals only with direct income benefits of EDA loans. Indirect benefits generated by the multiplier process, both in terms of income and employment, will be described in Chapter V .

Income data was derived on an annual basis from the weekly earnings of EDA income and other jobs reported in the survey and annual net earnings from farm employment.

For the total group of new employees, income from EDA employment over the period of a year was $7,748,000. The average annual income from EDA employment was $4,264, only slightly above the poverty level (See Table 8).

Since most employees had no other job or farm income, those who do have additional income, make a great deal more than the $260 annual difference between current income and EDA income indicated by the means. Average EDA incomes of heads of households are about 18% higher than incomes for non-heads of households. Additional income from other sources of employment is also higher for heads of households. In fact, heads of households accounted for most of the income from other jobs and farm employment

The increase in income from prior employment to current employment was computed on an annual increase basis (See Table 9). Since being hired by their current employers, the average annual increase for heads of households was about $381 less per year than for non-heads of households. Since their current average incomes were more than those of non-heads of households, the prior income of heads of households exceeded the prior incomes of the non-head of households by more than the 18% current difference.

The annual average increase was not uniform among low, middle and high income groups. New employees were divided into three groups according to their total current annual income. The low-income group was made up of those individuals earning less than $4,000 a year. The middle income group included those reporting incomes between $4,000 and $10,000 a year and the high income group included those making above $10,000 per year.

Over 50% of the new employees were still earning less than $4,000 a year (See Table 10). Mean current income ($3,150) was only slightly more than mean EDA income ($3,133) for the poor. This implies that few secondary jobs were available to supplement poverty-level incomes.

Of the 913 new employees with poverty-level incomes, less than half were heads of households. Their mean EDA income and mean total income were slightly more than the means for non-head of households. However, the average annual increase in income for heads of households ($429)

was about one-third of the average annual increase for those that were not heads of households ($1, 209) in the low income group.

Almost 71% of the formerly unemployed were in the low income group. However, only 22% of the unemployed were heads of households with poverty level incomes. The major gains in raising income above poverty levels were for heads of households (See Table 4).

The middle income group included 479 new employees who were formerly in the poverty group but now earned over $4,000 a year (See Table 3). However, 164 employees who reported former incomes above $4,000 now had incomes below the poverty level. Most of these indicated a decrease of $1,000 - $2,000 a year, which may not be unusual in a rural situation where other sources of jobs were closed or moved to different locations. A few employees reported decreases of up to $7,000 a year, and no apparent explanation is available in these cases.*

This movement between income groups results in a net increase for the middle income group of 315 employees. For this income group the difference between EDA income average ($5,350) and the total current income ($5,619) was much higher than that of the lower income group ($1,800)*.

Heads of households made up about 69% of this group and mean incomes were about $350 higher for them than for non-heads of households. Annual average increase was less than two-thirds of that for middle income employees who are not heads of households (Table 11).

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* This data is available from responses to this initial survey questionnaire provided by Chilton Research Services. (See Exhibit IV-1)

For the over-$10,000 income group, the average income from other sources ($5,719) almost equaled average income from EDA-financed jobs ($6,511). From the high figure for secondary income and the large average annual increase in income ($6,906), it was evident that EDA had greatly expanded the earnings total for this group (See Table 12).

Heads of households in this category had a much smaller proportion of EDA income to total income and, as in the poverty and middle income groups, a smaller average annual increase in income.

C. Costs

Over the five-year period 1962-67, the 40 firms whose employees were surveyed received at least one business loan from EDA-ARA. Four firms received two loans in this time period.

Total amount of the loans was $23,180,000. Individual loan amounts ranged from $56,000 to $2,620,000, the average being about $527,000. For the proposed projects, EDA and ARA loan money was supplemented by $15,435,000 from other sources -- private industry and state and local governments. The major portion (60%) of the project money, however, was from EDA and ARA.

Seven companies having a total of 514 employees had not hired any new employees since the loan approval. * Therefore, these firms gen-

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* Loan approval dates for these companies averaged over five years ago.

erated no direct employment or income impacts. Thirty-three companies had hired a total of 1,874 new employees and retained 460 employees who were hired before the loan was received.

The size of the companies varied greatly -- from one with only four employees to one with 650 employees. The average company had approximately 70 employees of which 57 were new employees.

On the basis of the data for 40 firms, the loan cost per new job created was $12,400, or said another way, 8.1 jobs were created for every $100,000 in EDA loans. This estimate is based upon the number of employees working in EDA loan-receipient firms hired after the data of loan. Included are the 58 jobs that would have been destroyed by bankruptcy. This estimate is considerably higher than most of the cost figures reported by the Evaluation of the ARA and EDA Loan Program.* If, instead of counting only those employees hired after the data of loan, we base our estimate upon the total employment in EDA loan-assisted firms, then the loan cost per job becomes $8,139, which is equivalent to 12.3 jobs per $100,000 in EDA loan. These figures are considerably closer to those reported in the earlier EDA evaluations (See Table 13).

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* Miller, S.,D. Gaskins, C. Liner, Evaluation of ARA and EDA Loan Program, Office of Economic Research, Economic Development Administration, November 10, 1968.

Table 1

Employment by Prior Status

Prior Status \ Present Status	Full Time	% Full Time	Part Time	% Part Time
Employed Full Time	1217	67.0	17	1.0
Employed Part Time	157	8.6	14	.7
New Labor Force Entrants	202	11.1	14	.7
Unemployed	188	10.4	8	.5
Total	1764	97.1	53	2.9

Table 2

Change in Residence

TO FROM	County Resident	In-Commuter
County Resident	1448	14
In-Commuter		223
In-Migrant	111	21

Table 3

Income Status

Current Status / Prior Status	Poor	Not Poor
Poor	749	479
Not Poor	164	425
TOTAL	913	904

3.11

Table 4

Measures of Program Effectiveness

Prior Status Above Poverty & Empl. *	Poor-Employed	Poor & Unemployed	Not Poor-Unemployed
Not Heads of Households	-40	90	33
Heads of Households	198	41	34
Total	158	131	57

* Net effect. Number raised from poverty minus the number whose income
dropped below $4000.

3.12

Table 5

Changes in Employment Status and Residence

Present Status Prior Status	Full-Time			Part-Time			Total		
	County Resident	In-Commuter	Total	County Resident	In-Commuter	Total	County Resident	In-Commuter	Total
County Residents									
Full-Time	938			11			949		
Part-Time	137			12			149		
NLFE	173			8			181		
Unemployed	162			7			169		
Total	1,410			38			1,448		
In-Migrant									
Full-Time	88			3			91		
Part-Time	5			2			7		
NLFE	8			1			9		
Unemployed	4			0			4		
Total	105			6			111		
Total									
Full-Time	1,026	191	1,217	14	3	17	1,040	194	1,234
Part-Time	142	15	157	14	0	14	156	15	171
NLFE	181	22	202	9	4	14	190	26	216
Unemployed	166	22	185	7	1	8	173	23	196
Total	1,515	250	1,764	44	8	53	1,559	258	1,817

3.13

Table 6

Heads of Households by Prior Status

Prior Status \ Present Status	Full Time	% Full Time	Part Time	% Part Time
Employed Full Time	844	79.7	13	1.2
Employed Part Time	76	7.2	1	.1
New Labor Force Entrants	51	4.8	1	.1
Unemployed	72	6.8	1	.1
Total	1043	98.5%	16	1.5%

3.14

Table 7

Non-Heads of Household by Prior Status

Prior Status \ Present Status	Full Time	% Full Time	Part Time	% Part Time
Employed Full Time	373	49.2	4	0.6
Employed Part Time	81	10.7	13	1.7
New Labor Force Entrants	151	19.9	13	1.7
Unemployed	116	15.3	7	.9
Total	721	95.1	37	4.9

Table 8

Annual Income of New Employees

Income / Employee Group	Number of Cases	EDA Annual Income	Mean Annual EDA Income	Annual Current Income	Mean Annual Current Income
All New Employees	1,817	7,748,000	4,264	8,247,000	4,538
Heads of Households	1,059	4,824,000	4,555	5,265,057	4,972
Non Head of Households	758	2,924,000	3,858	2,981,606	3,934

3.16

Table 9

Annual Income Increases of New Employees

Employee Group / Income	Number of Cases	Total Annual Increase	Average Annual Increase
All New Employees	1,817	$ 2,531,000	$ 1,393
Heads of Households	1,059	1,306,667	1,234
Non Heads of Households	758	1,224,118	1,615

Table 10

Aggregate Annual Income (Low)
Income New Employees

	Total Group	Heads of Households	Non Heads of Households
Employee Group — Income			
EDA Income	2,860,196	1,335,850	1,524,346
Total Current Income	2,876,411	1,345,122	1,531,289
Annual Increase in Income	773,308	181,411	591,897
Number of Employees	913	423	490

3.18

Table 11

Aggregate Annual Income (Middle)
Income New Employees

Income \ Employee Group	Total Group	Heads of Households	Non Heads of Households
EDA Income	4,600,948	3,258,337	1,342,611
Total Current Income	4,832,127	3,441,430	1,390,697
Annual Increase in Income	1,453,612	864,431	589,181
Number of Employees	860	597	263

3.19

Table 12

Aggregate Annual Income (High)
Income New Employees

Income / Employee Group	Total Group	Heads of Households	Non Heads of Households
EDA Income	286,499	230,041	56,458
Total Current Income	538,125	478,505	59,620
Annual Increase in Income	303,875	260,835	43,040
Number of Employees	44	39	5

3.20

Table 13

Cost Per Employee

Study	Loan Amount per Employee	Employees per $100,000 of loan
Special Impact Survey	$7,705	13.0
Survey of Eight ARA-EDA Business Loan-Recipient Firms	5,291	18.9
Employment and Financial Data from EDA National and Field Office Files	5,492	18.2
Office of Audits Review	5,434	18.4
Chilton/CONSAD	12,369	8.1

IV. CHARACTERISTICS OF EMPLOYEES SURVEYED

In Chapter III, the employment and income generated by the firms that received EDA loans was described. This chapter will describe the socio-economic characteristics of these employees in order to provide a view of the factors that affect the incidence of program benefits.

Exhibit IV-1 is a copy of the questionnaire that was furnished to 2,847 employees of 40 firms. Of these, 2,127 questionnaires were filled out and returned, and 2,020 were properly completed. 1,344 of these were "new" employees.*

A profile of the average new employee is provided in Section A of this chapter. Section B provides details on characteristics of new employees, in general, and on characteristics of subgroups such as the poor, unemployed and new labor force entrants.

A. Profile of the New Employee

The average new employee of the EDA loan recipient firm is a young man, probably under 35 (62%), married, two children. He is most likely to be white (77%) and has probably attended or graduated from high school (68%).

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* Hired after the date of approval of the EDA loan.

This employee lives in the same county in which he works (86%), probably within 6 miles of his employer's location (53%), and is a long-term (9 years or more) resident of the community (69%).

He is employed full time as an semi-skilled worker (64%) and holds only one job in spite of the fact that he earns less than $100 a week (77%). He has probably been employed by this company for less than two years (80%).

Before the employee was hired by the EDA loan recipient firm, he was employed full time in the same county (57%). He worked for his former employer for three years or less (62%*) and made under $80 a week as a semi-skilled worker (61%*). When he left his former job. his employer probably hired someone to replace him (62%*).

If the new employee is a woman, she is much more likely to have previously been unemployed or to be a new labor force entrant (42%). She probably is not the head of a household and makes less than $4,000 a year (74%).

B. Characteristics of New Employees**

Questionnaires with complete information were returned by 1,344 employees hired after the date of approval of an EDA loan. As described

------

   * % of former full time employees.

   ** Hired after the date of approval of the EDA loan.

in Chapter III, of these 1,344 employees, 97% are currently employed full-time and only 3% are employed part-time. Over two-thirds were employed full-time before they were hired by their current employer. About 10% had been employed part-time and about 11% had been unemployed. The remaining 12% were new entrants to the labor force. *

More than half of the total group currently have poverty level incomes.

Responses were analyzed for 9 characteristics by current and former employment status. A brief summary of the distribution of characteristics is given here. Contained in this chapter are tables showing details employee characteristics.

I. Sex. (See Figure I)

Of the replies received, 62% were from men and 38% were from women. Most of the men (80%) had formerly been employed full-time, while less than half (48%) of the women had been full-time employees. The previous unemployment rate of the women (17.9%) was almost three times as high as that of the men (6.4%).

Although almost all of the new employees (97% of both men and women) were currently working full time, only 38% of the men had poverty level incomes, while 74% of the women did.

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* Had not been employed and were not actively looking for work.

2. Age. (See Figure 2)

The new employees were slightly younger than those who had been hired before the EDA loan.

The under-21 group had the lowest rate of former full-time employment (54%) and the highest rates of former part-time (20 %) and unemployed (12 %) workers. The unemployment rate decreas.s as the age of the workers increases.

3. Race. (See Figure 3)

There were more Negroes among the new employees (20%) than among employees hired before the date of the loan (10%). The former employment status of minority groups differed greatly from that of th white employees. (See Table 1)

All of the minority groups had a significantly larger proportic of poverty-level incomes (71%) than did the whites (46%).

4. Education. (See Figure 4)

Most of the new employees had attended or graduated from high school. The average number of years of school attendance was about 10.

5. Heads of Households. (See Figure 5)

About 55% of the new employees considered themselves heads of households. Most of these had been previously employed full-time (55%). About half of the non-heads of households had been employed

4.4

full time. However, about 75% of those who were not heads of house-
holds indicated that they contributed to the support of a family unit.

6.   Length of Residence. (See Figure 6)

Most of the new employees were long-term residents of the county;
68 % had lived in the same town for more than nine years. Less than
40% of the new employees who had lived in the area less than one year
had poverty-level incomes, while 53% of the long term residents had
incomes of less than $ 4, 000 a year. The long-term residents also
had the highest previous unemployment rate (12 %), as compared with
6 % for the less-than-one-year group.

7. Skills. (See Figure 7)

Most of the new employees were operatives (63 %). An addi-
tional 33% were in four skill groups: craftsmen and foremen (12 %)
of the total), clerical workers (8%), laborers (6 %), and service
workers (5%).

Laborers and clerical workers had the lowest rates for former
full-time employment (56% and 61%) and the highest rates of part-time
employment (23% and 13%). The highest rates of previous unemploy-
ment were for operatives (13%) and service workers (14%).

8.   Holds Another Job.   (See Figure 8)

Only 6 % of the new employees held another job.   This group included 16% of all former farm workers but only 2% of the formerly unemployed.

9.   Nearness to Job.   (See Figure 9)

Over half of the new employees lived within six miles of their job.   Almost 36% of the full-time employees and 24% of the part-time employees lived within three miles.   Slightly more than 10% lived more than 20 miles from their work.

C.   Special Emphasis Groups

Some distinguishing characteristics of groups given special emphasis in Chapter 5 were noted.

Over half (55%) of the 690 employees categorized as poor were women.   Women also make up a majority of the previously unemployed (63%) and of the new labor force entrants (76%).   Because of the large number of women in the previously unemployed and new labor force entrants groups, most of them also appear as non-heads of households.

More Negro employees are poor (28%) than are non-poor (12%).

Current part-time employees are more likely to be under 21 (34%) and to be employed as service workers (31%) or clerical employees (26%).   They are also more likely to be non-heads of households (77%).

11   Figure 1

	PRIOR STATUS										CURRENT STATUS								
SEX	Full Time		Part Time		NLFE		Unemployed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Men	664	73	74	59	39	24	53	37	72	77	806	62	24	63	830	62	312	45
Women	249	27	52	41	121	76	92	63	21	23	500	38	14	37	514	38	378	55
TOTAL	913	100	126	100	160	100	145	100	93	100	306	100	38	100	1344	100	690	100
Information Not Available	27		13		26		1		9		23		25		66		42	

4.7

Figure 2

AGE	PRIOR STATUS										CURRENT STATUS							
	Full Time		Part Time		NLFE		Unemployed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 21	106	12	40	32	27	17	24	17	14	15	184	14	13	34	197	15	115	17
21-24	157	17	21	17	28	17	33	23	14	15	233	18	6	16	239	18	111	16
25-29	160	17	18	14	19	12	18	12	14	15	210	16	5	13	215	16	101	15
30-34	125	14	11	9	19	12	21	14	13	14	174	13	2	5	176	13	88	13
35-39	96	10	14	11	15	9	8	6	15	16	131	10	2	5	133	10	76	11
40-44	69	8	6	5	27	17	11	8	3	3	112	9	1	3	113	9	59	8
45-49	84	9	6	5	11	7	12	8	7	8	111	9	2	5	113	9	61	9
50-54	55	6	4	3	8	5	11	3	6	7	75	6	3	8	78	6	38	6
55-59	43	5	2	2	5	3	7	5	3	3	55	4	2	5	57	4	29	4
60-64	15	2	2	2	1		0		3	3	17	1	1	3	18	1	9	1
65 and over	3		1	1	0		0		1	1	3		1	3	4		3	
TOTAL	913	100	125	100	160	100	145	100	93	100	1305	100	38	100	1343	100	690	100
Information Not Available	27		14		25		1		9		24		25		67		42	

4.8

Figure 3

RACE	PRIOR STATUS										CURRENT STATUS							
	Full Time		Part Time		NLFE		Unemployed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
White	695	76	81	64	140	88	113	80	49	53	1005	77	24	65	1029	77	473	68
Negro	190	21	42	34	16	10	22	15	35	37	260	28	10	27	270	20	192	28
Indian	16	2	3	2	2	1	7	5	8	9	25	2	3	8	28	2	18	3
Spanish American	8	1	0		2	1	0		1	1	10	1	0		10	1	6	1
Oriental	0		0		0		0		0		0		0		0		0	
TOTAL	909	100	126	100	160	100	142	100	93	100	1300	100	37	100	1337	100	689	100
Information Not Available	31		13		25		4		9		29		26		73		43	

4.9

Table 1

Former Employment Status *

	Unemployed	Part-Time	Farm Worker
White	11%	8%	5%
Negro	8%	16%	13%
Indians	25%	11%	29%

* Percentage given is percent of total racial
  groups (i.e., white) of new employees.

Figure 4

EDUCATION	PRIOR STATUS										CURRENT STATUS								
	Full Time		Part Time		NLFE		Unemployed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Never Attended School	7	1	0		0		0		4	4	7	1	0		7	1	3	1
Attended Grammar	114	12	6	5	15	9	19	13	14	15	152	12	2	5	154	11	89	13
Graduated Grammar Sch.	69	8	9	7	9	6	13	9	10	11	97	7	3	8	100	7	54	8
Attended High School	290	32	38	30	49	31	42	29	34	37	407	31	12	32	419	31	218	32
Graduated High School	328	36	46	36	62	38	58	40	27	29	483	37	11	29	494	37	259	38
Attended College	84	9	20	16	15	9	12	8	4	4	126	10	5	13	131	10	49	7
Graduated College	11	1	2	2	9	6	1	1	0		18	1	5	13	23	2	7	1
Graduate Work	10	1	5	4	1	1	0		0		16	1	0		16	1	1	
TOTAL	913	100	126	100	160	100	145	100	93	100	1306	100	38	100	1344	100	690	100
Information Not Available	27		13		25		1		9		23		25		66		42	

4.11

Figure 5

HEADS OF HOUSEHOLDS	PRIOR STATUS										CURRENT STATUS								
	Full Time		Part Time		NLFE		Unemployed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	598	68	54	44	36	23	51	36	64	71	728	58	11	31	739	57	368	56
No	287	32	68	56	118	77	89	64	26	29	538	43	24	77	562	43	286	44
TOTAL	885	100	122	100	154	100	140	100	90	100	1266	100	35	100	1301	100	654	100
Information Not Available	55		17		31		6		12		63		28		109		78	

4.12

Figure 6

LENGTH OF RESIDENCE	PRIOR STATUS										CURRENT STATUS							
	Full Time		Part Time		NLFE		Unemployed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Less than one year	80	9	10	8	13	8	6	4	5	5	108	8	1	3	109	8	43	6
One Year	26	3	3	2	7	4	7	5	1	1	40	3	2	6	42	3	21	3
Two Years	52	6	4	3	5	3	4	3	2	2	65	5	0		65	5	29	4
Three Years	37	4	6	5	8	5	3	2	2	2	52	4	2	6	54	4	23	3
Four Years	28	3	2	2	6	4	2	1	3	3	34	3	4	11	38	3	18	3
Five Years	33	4	3	2	5	3	3	2	4	4	43	3	1	3	44	3	23	3
Six Years	9	1	2	2	3	2	4	3	0		17	1	1	3	18	1	10	1
Seven Years	12	1	3	2	5	3	1	1	0		20	2	1	3	21	2	12	2
Eight Years	12	1	4	3	7	4	3	2	1	1	24	2	2	6	26	2	12	2
Nine Years or More	618	68	88	71	101	64	112	77	73	82	897	69	22	61	919	69	493	72
TOTAL	907	100	125	100	160	100	145	100	91	100	1300	100	36	100	1336	100	684	100
Information Not Available	33		14		25		1		11		29		27		74		48	

4.13

Figure 7

SKILLS	PRIOR STATUS										CURRENT STATUS							
	Full Time		Part Time		NLFE		Unemploy-ed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Professional	12	1	2	2	2	1	0		1	1	15	1	1	3	16	1	1	
Farmers and Farm Managers	0		0		0		0		0		0		0		0		0	
Managers	8	1	0		1	1	1	1	1	1	9	1	1	3	10	1	1	
Clerical	61	7	14	12	27	17	7	5	1	1	100	8	9	26	109	8	49	8
Sales	5	1	0		0		0		0		5		0		5	1	1	
Craftsmen and Foremen	127	14	7	6	10	7	12	8	5	6	155	12	1	3	156	12	26	4
Operatives	571	64	68	57	104	67	106	74	69	76	840	66	9	26	849	64	471	74
Service Workers	48	5	9	7	6	4	10	7	5	6	62	5	11	31	73	6	35	5
Farm Laborers	4	1	1	1	0		0		4	4	5		0		5	1	1	
Laborers	51	6	19	16	5	3	8	6	5	6	80	6	3	9	83	6	55	9
TOTAL	887	100	120	100	155	100	144	100	91	100	1271	100	35	100	1306	100	640	100
Information Not Available	53		19		30		2		11		58		28		104		92	

Figure 8

HOLDS ANOTHER JOB	PRIOR STATUS										CURRENT STATUS							
	Full Time		Part Time		NLFE		Unemployed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	68	8	9	7.1	2	1.3	3	2.1	15	16.1	75	6	7	18.4	82	6	12	2
No	844	92	117	93	158	99	142	98	78	84	1230	94.2	31	82	1261	94	677	98
TOTAL	912	100	126	100	160	100	145	100	93	100	1305	100	38	100	1343	100	689	100
Information Not Available	28		13		25		1		9		24		25		67		43	

4.15

Figure 9

NEARNESS TO JOB	PRIOR STATUS										CURRENT STATUS								
	Full Time		Part Time		NLFE		Unemployed		Farm		Full Time		Part Time		Total		Poverty	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Less than one mile	97	11	19	15	12	8	9	6	6	6	133	10	4	11	317	10	69	10
1.0 - 2.9	228	25	30	24	45	30	34	24	18	19	332	26	5	14	337	25	190	28
3.0 - 5.9	146	16	33	27	24	15	33	23	18	19	231	18	5	14	236	18	121	18
6.0 - 9.9	124	14	24	15	13	10	22	15	17	18	177	14	6	17	183	14	85	12
10.0 - 14.9	131	14	10	8	21	13	20	14	15	16	178	14	4	11	182	14	95	14
15.0 - 19.9	69	8	7	6	16	10	14	10	4	14	103	8	3	9	106	8	58	8
20.0 - 29.9	84	9	10	8	11	7	10	7	11	12	110	8	5	14	115	9	53	8
30.0 or more	29	3	3	2	3	2	2	1	4	4	34	3	3	9	37	3	13	2
TOTAL	908	100	125	100	156	100	144	100	93	100	1298	100	35	100	1333	1000	684	100
Information Not Available	32		14		29		2.		9		31		28		77		48	

4.16

EXHIBIT IV-1

EMPLOYEE TREND STUDY

We are conducting a worker study to determine their work patterns during the last three or four years. You can help us greatly by providing the information requested in this questionnaire. You are never identified with your answers which are combined with all other answers to form a picture of the area as a whole. Most questions can be answered by checking a box. Please disregard the small numbers before the boxes -- they are for tabulation purposes only. Thank you.

Your Name:_____ Home Telephone Number:_____

First, we would like to get some general characteristics of your background.
PLEASE CHECK ONLY ONE BOX FOR THE FOLLOWING QUESTIONS:

1) Please check whether you are male or female?

    9-1 ☐ Male   2 ☐ Female

2) Are you married, never married, widowed or divorced?

    10-1 ☐ Married   2 ☐ Never married   3 ☐ Widowed   4 ☐ Divorced

3) Please check the last grade or class you completed in your schooling.

    11-1 ☐ Never Attended School   5 ☐ Graduated High School

    2 ☐ Attended grammar school   6 ☐ Attended College
        did not graduate   did not graduate

    3 ☐ Graduated Grammar School   7 ☐ Graduated College

    4 ☐ Attended High School   8 ☐ Graduate Work
        did not graduate

4) Please check the one box which tells us your age.

    12-1 ☐ Under 21   5 ☐ 35 - 39   9 ☐ 55 - 59

    2 ☐ 21 - 24   6 ☐ 40 - 44   0 ☐ 60 - 64

    3 ☐ 25 - 29   7 ☐ 45 - 49   X ☐ 65 & Over

    4 ☐ 30 - 34   8 ☐ 50 - 54

4.18

5) Please check ONLY one box.

13-1 ☐ WHITE   2 ☐ NEGRO   3 ☐ INDIAN

       4 ☐ SPANISH AMERICAN   5 ☐ ORIENTAL

6) Including yourself, how many members of your family are there living with you?

14-1 ☐ One	5 ☐ Five	9 ☐ Nine
2 ☐ Two	6 ☐ Six	0 ☐ Ten or More
3 ☐ Three	7 ☐ Seven	
4 ☐ Four	8 ☐ Eight	

7) How many of them are children under 18 years of age?

15-0 ☐ None	4 ☐ Four	8 ☐ Eight
1 ☐ One	5 ☐ Five	9 ☐ Nine or More
2 ☐ Two	6 ☐ Six	
3 ☐ Three	7 ☐ Seven	

8) Are you the principal bread winner of the family?

16-X ☐ YES   SKIP TO Q. 9   1 ☐ NO , please answer:

                           a) Do you contribute to the support of the family?

                             17-1 ☐ YES   X ☐ NO

9) Please list the City or Town, County and State in which you live.

_____   _____
     (City or Town)   (County)

_____
     (State)   4.19

10) About how long have you been living in this town? PLEASE CHECK ONLY ONE BOX.

20-0 ☐ Less than 1 year   4 ☐ Four years   8 ☐ Eight years

  1 ☐ One year   5 ☐ Five years   9 ☐ Nine years or More

  2 ☐ Two years   6 ☐ Six years

  3 ☐ Three years   7. ☐ Seven years

---

11). a. Were you living in this county before you started your present job or not?

      21-X ☐ YES   1 ☐ NO

b. If not, please specify the county in which you lived?

                                                                         22-

              (County)   (State)

---

12) Please indicate about how much of your purchases, none, some, half, most or all, for the following items are spent in the county in which you live. (PLEASE CHECK ONE BOX FOR EACH TYPE OF PURCHASE)

Type Of Purchase		NONE	SOME-APPX. 25%	HALF-APPX. 50%	MOST-APPX. 75%	ALL
Food	23-0	☐	1 ☐	2 ☐	3 ☐	4 ☐
Family Clothing	24-0	☐	1 ☐	2 ☐	3 ☐	4 ☐
Large purchases such as:						
Appliances, furniture, cars, etc.	25-0	☐	1 ☐	2 ☐	3 ☐	4 ☐
Other purchases	26-0	☐	1 ☐	2 ☐	3 ☐	4 ☐

Now, let us talk about your current employment.

13) About how long have you been working for this company at this location? PLEASE CHECK ONLY ONE BOX.

27-0 ☐ Less than 1 year   6 ☐ 3 1/2 yrs. but less than 4 yrs.

  1 ☐ One year but less than 18 months   7 ☐ 4 years but less than 4 1/2 yrs.

  2 ☐ 18 months but less than 2 years   8 ☐ 4 1/2 years but less than 5 yrs.

  3 ☐ 2 years but less than 2 1/2 years   9 ☐ Five years or more

  4 ☐ 2 1/2 years but less than 3 years

  5 ☐ 3 years but less than 3 1/2 years

4.20

14) a) Did you work for this company somewhere else?

28-1 ☐ YES   2 ☐ NO

b) If YES, where was that, in what City or Town, County or State?

_____   _____
(City or Town)   (County)

_____
(State)   29-

---

15) Do you generally work full-time (35 hours each week or more) or part-time (less than 35 hours each week)?

30-1 ☐ Full-Time   2 ☐ Part-Time

---

16) During the past 12 months, about how many months have you worked for this company at this location?

31-1 ☐ One Month	5 ☐ Five Months	32-1 ☐ Nine Months
2 ☐ Two Months	6 ☐ Six Months	2 ☐ Ten Months
3 ☐ Three Months	7 ☐ Seven Months	3 ☐ Eleven Months
4 ☐ Four Months	8 ☐ Eight Months	4 ☐ Twelve Months

---

17) What is your present occupation, that is, what do you do?

33-

_____   _____
(Type of Work Done)   (Title)

---

18) About how far do you travel to work each day?_____ (One Way)
(MILES)

34-

---

19) Please check the ONE box which shows how much you normally earn each week from this job, before deductions.

35-0 ☐ Less than $40	4 ☐ $100 to $119	36-1 ☐ $180 to $199
1 ☐ $40 to $59	5 ☐ $120 to $139	2 ☐ $200 to $219
2 ☐ $60 to $79	6 ☐ $140 to $159	3 ☐ $220 and Over
3 ☐ $80 to $99	7 ☐ $160 to $179	

20) Do you have another job besides this one?

37-1 ☐ YES   X ☐ NO – If NO,   SKIP TO QUESTION 24

---

21) What do you do at your other job?

_____   _____ 38-
       (Type of Work Done)   (Title)

---

22) Please check the ONE box which shows how much you normally made each week from this other job in 1968.

39-1 ☐ Less than $40   5 ☐ $100 to $119   40-1 ☐ $180 to $199

   2 ☐ $40 to $59   6 ☐ $120 to $139   2 ☐ $200 to $219

   3 ☐ $60 to $79   7 ☐ $140 to $159   3 ☐ $220 and Over

   4 ☐ $80 to $99   8 ☐ $160 to $179

---

23) Where is this job located -- in what City or Town, County and State?

_____   _____
       (City or Town)   (County)

_____   41-
       (State)

---

24) Now, please check the ONE box which best describes your previous employment status, that is, before you took the job described in questions 13 thru 19.

42-1 ☐ Worked on a farm   3 ☐ Worked Part-Time-Less than
                                                   35 hours a week
        (Now please answer Questions
        25 to 29 on blue form only)   (Answer Questions 35 thru 38
                                                   on gold form only)

   2 ☐ Worked full-time somewhere else   4 ☐ Unemployed
        ...over 35 hours a week and for   (Answer Questions 39 thru 44
        more than 45 weeks a year   on pink form only)

        (Answer Questions 30 thru 34 on
        green form only)

4.22

Those who previously worked on a farm
please answer Questions 25 thru 29.

25) Did you own the farm?

44-1 [ ] YES   2 [ ] NO

26) Did you work full-time(at least 35 hours a week) or part-time (less than 35 hours a week) on the farm?

45-1 [ ] Full-Time   2 [ ] Part-Time

a. If worked only part-time, please indicate whether you preferred to work part-time or not.

46-1 [ ] Preferred Part-Time   2 [ ] Did Not

27) About how many months a year did you work?

47-1 [ ] One Month   5 [ ] Five Months   48-1 [ ] Nine Months

2 [ ] Two Months   6 [ ] Six Months   2 [ ] Ten Months

3 [ ] Three Months   7 [ ] Seven Months   3 [ ] Eleven Months

4 [ ] Four Months   8 [ ] Eight Months   4 [ ] Twelve Months

28) How much did you earn a year (After deducting farm expenses such as feed, fertilizer and equipment)?

49-1 [ ] Less than $1,000   5 [ ] $4,000 - $4,999   50-1 [ ] $7,500 - $9,999

2 [ ] $1,000 to $1,999   6 [ ] $5,000 - $5,999   2 [ ] $10,000 - $14,999

3 [ ] $2,000 - $2,999   7 [ ] $6,000 - $6,999   3 [ ] $15,000 & Over

4 [ ] $3,000 - $3,999   8 [ ] $7,000 - $7,499

29) a) Do you still work on the farm in your spare time?

51 -1 [ ] YES   2 [ ] NO

b) If you still work on the farm, about how much do you earn from the farm in a year?

52-1 [ ] Less than $1,000   5 [ ] $4,000 - $4,999   53-1 [ ] $7,500 - $9,999

2 [ ] $1,000 to $1,999   6 [ ] $5,000 - $5,999   2 [ ] $10,000 - $14,999

3 [ ] $2,000 - $2,999   7 [ ] $6,000 - $6,999   3 [ ] $15,000 & Over

4 [ ] $3,000 - $3,999   8 [ ] $7,000 - $7,499

4.23

Those who previously worked somewhere else
full-time, please answer Questions 30 to 34

30) About how much did you earn in an average work week at your previous job before
deductions?

55-0 ☐ Less than $40   4 ☐ $100 to $119   56-1 ☐ $180 to $199

    1 ☐ $40 to $59   5 ☐ $120 to $139   2 ☐ $200 to $219

    2 ☐ $60 to $79   6 ☐ $140 to $159   3 ☐ $220 and Over

    3 ☐ $80 to $99   7 ☐ $160 to $179

31)   About how long did you work there?

_____ 57-

32) Where was this company located ... in what City or Town, County and State?

_____   _____
       (City or Town)   (County)

_____
       (State)   58-

33) What was your occupation, that is, what did you do?

                                                      59-
_____   _____
      (Type of Work Done)   (Title)

34) When you left, did your employer (Company) hire someone to replace you?

    60 -1 ☐ YES   2 ☐ NO   3 ☐ DON'T KNOW

If worked less than 35 hours each week previous to beginning
your present job, please answer questions 35 thru 38.

35) Did you prefer to work less than 35 hours a week?

62-1 ☐ YES   2 ☐ NO

36) About how many hours did you work in a normal week?

63-1 ☐ Less than 10 hours   4 ☐ 20 to 24 hours

2 ☐ 10 to 14 hours   5 ☐ 25 to 29 hours

3 ☐ 15 to 19 hours   6 ☐ 30 to 34 hours

37) Please check the ONE box which shows how much you earned in an average week before
deductions from this job.

64-1 ☐ Less than $20   5 ☐ $50 to $59   65-1 ☐ $120 to $149

2 ☐ $20 to $29   6 ☐ $60 to $69   2 ☐ $150 & Over

3 ☐ $30 to $39   7 ☐ $70 to $89

4 ☐ $40 to $49   8 ☐ $90 to $119

38) What did you do at that job?

_____   _____ 66-

(Type of Work Done)   (Title)

4.25

Those who were unemployed,
please answer Questions 39 to 44

39) Were you actively looking for work?

68-1 ☐ YES   . 2 ☐ NO

40) Please check all the reasons why you were not working.
PLEASE CHECK AS MANY AS APPLY . . .

69-1 ☐ Long Illness   6 ☐ Awaiting recall to a job

2 ☐ Care for children   7 ☐ No work available

3 ☐ Enrolled in school   8 ☐ Laid off

4 ☐ Military   9 ☐ Moved

5 ☐ Didn't want work   SP ☐ None of the above

41) Were there any other reasons? Please Explain:_____

_____

_____

_____

70-

_____

42) About how long were you out of work? PLEASE CHECK ONLY ONE BOX.

71 -1 ☐ Less than 6 weeks   2 ☐ 6 to 15 weeks   3 ☐ Over 15 weeks

43) Were you receiving any welfare payments or unemployment insurance when you were
out of work?

72-1 ☐ YES   2 ☐ NO

44) If YES, about how much were you receiving each month?

$_____   73-_____

4.26

V. ANALYSIS OF THE DETERMINANTS OF PROGRAM SUCCESS

The factors underlying the success of a business loan program can be analyzed simply in terms of their effects upon the likelihood that loans will be in default, or equivalently, that firms will fail. Indeed, such an analysis has much to contribute to program planning by clarifying the risk elements characterizing each loan so that loan approval decisions can be rationally based.

Where high risk loans are in conformity with program objectives, at the very least the analysis of factors underlying default will provide planners with a means for estimating future program costs. But where other objectives underlie the program, such as the maximization of poverty reduction, then the default rate, or in more positive tone, the success likelihood, becomes an instrumental variable that affects the extent to which program objectives will be realized. In this case, knowledge of the factors underlying the probability of success is a necessity for purposes of program control.

But since program objectives center around the achievement of economic and welfare magnitudes, success will be measured by more than the "no default" criterion. The extent of success as measured by unemployment reduction, poverty amelioration, or contribution to total area product will be essential elements of the evaluation indicators. Here, the factors that condition the degree of success are of interest to the program planning process. Knowledge of such factors will aid in the loan approval decision

through knowledge of conditions that should be avoided, and will provide information on the factors controllable by the program itself.

In this chapter, accordingly, two types of analyses will be made:

1. Factors affecting the probability of success, and

2. Factors affecting the magnitude of success.

The factors to be analyzed in each case will be grouped into three sets: characteristics of the firm; characteristics of the loan; and socio-economic characteristics of the environment in which the firm is to be located. Of these three sets of factors, the second, characteristic of the loan, is directly controllable in the planning process. The size of the loan, for example, of critical interest in the selection of loan applicants and in program budgeting, is subject to control within the program. If the magnitude of success increases more than proportionately with the magnitude of the loan, the larger loans will be indicated, up to the point of diminishing returns (O L in Figure 1). But this is not meant to imply that the characteristics of the loan are of dominant importance among the factors that underlie program success.
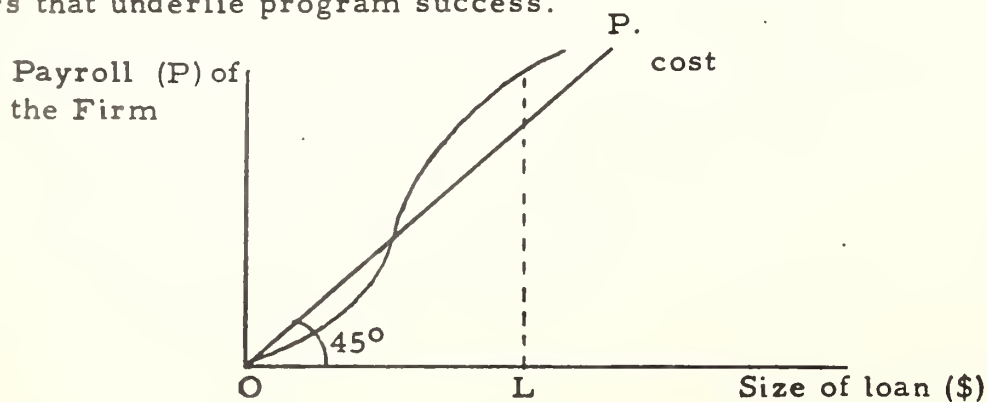

Figure 1: Factors Affecting Size of Loan Decision

It is one of many potentially important factors, among which are those that, while not directly subject to program control, are subject to consideration in the loan approval process. Thus, if a firm has special labor requirements, and these factors are known to have a depressing, if not pre-emptive effect upon the "payroll curve" (as in curve P_2 in Figure 2), then labor applicants possessing such characteristics can be avoided in favor of those with characteristics indicating higher probability of success.
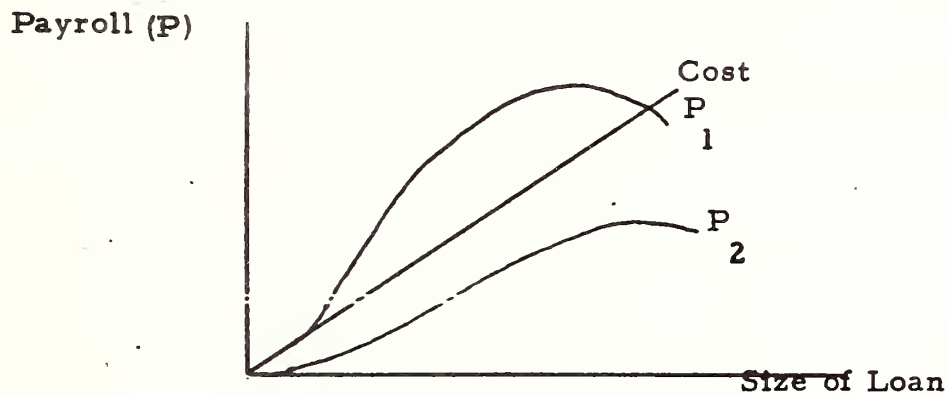
Payroll (P)

Figure 2: Factors Affecting Loan Approval Decision

A. Analysis of the Determinants of Success Probability

In this section, multivariate analytic techniques are applied for assessing the determinants of success probability. The first such application is the use of multiple regression analysis (ordinary least squares) to the following relation:*

---

* See Table 1 for list of variables in relation to equation 1.

$$(1) \quad \delta = a + \sum_{e=1}^{2} b_i \, SIC_i + \sum_{j=1}^{3} b_j \, ACT_j + g_1 \, EDATO + g_2 \, EDAPR + g_3 TIME$$

<div style="text-align:center">

Char.   Char.
of Firm   of Loan

</div>

$$+ \, h_1 \, POP + h_2 \, \Delta POP + h_3 \, MIG + h_4 \, M/ED + h_5 \, \%FEM$$

$$+ \, h_6 \, M/AG + h_7 \, M/WG + h_8 \, \%MG + h_9 \, \%INC + h_{10} \, \%PUT$$

<div style="text-align:center">

Characteristic of Community

</div>

The analysis was made using various logarithmic transformations of the data, as well as of the data in its original form. The analysis was made upon data for 68 counties (observations) of which 27 contained default-loan firms, and 41 contained successful firms, all of which obtained ARA loans between 1962 and 1965.* Given that the dependent variable is limited only to zero and one values, the predictive power of an initial regression in which all variables were included was encouraging (R^2 = .567). From this run, nine variables were found to be most appropriate for inclusion for further analysis. The results of a linear regression of these variables are shown in columns 1 and 2 of Table 2.**

Following a series of tests using logarithmic transformations on the variables, eight variables were found most appropriate for inclusion, the results are shown in columns 3 and 4 of Table 2. This regression provides an R^2 of .58, with all eight variables significantly associated with the dependent variable. Of considerable interest are the following:

1. A non-linear (log) transformation for "size of EDA loan" provides a better fit than a linear transform.

---

* The successful firm sample included most of the surveyed firms, but contained many not surveyed.
** The analysis was that of step-wise multiple regression using BIO-

Table 1

List of Variables*

δ = is 0 if firm defaulted; 1 if firm succeeded

SIC_i = is industry classification: i=1 if industry is resource oriented; i=2 if labor oriented; i=3 if recreation oriented

ACT_j = is firm classification: j=1 if firm is new; j=2 if branch plant; j=3 if plant expansion; j=4 if loan save firm

b_i, b_j = dummy coefficients (0, 1)

EDATO = is size of EDA loan

EDAPR = is size of EDA loan as a percent of total project cost

TIME = is number of months since the date of loan approval

POP = is 1960 population of the county in which firm is located

ΔPOP = is the change in county population, 1950-1960

MIG = is the county net migration rate, 1955-1960

M/ED = is the median county education (years school completed)

%FEM = is the percent of females in county labor force

M/AG = is the median age of the county population

M/WG = is the median county manufacturing wage, 1960

%MG = is the percent county labor force in manufacturing industry, 1960

Table 1 (continued)

%INC   = is the aggregate county income growth rate, 1962-1966

%PVT   = is the % of families earning under $3000 (poverty)

TABLE 2

Regression with Success Probability as Dependent
Variable Number of Observations: 68

	Linear Variables		Mixed Transform		Logarithmic
	coefficient	t-value	coefficient	t-value	Transform
SIC (1)	-0.278	-2.1	-0.139	-2.6	Yes
SIC (2)	-0.305	-2.3	-0.123	-2.2	Yes
ACT (1)	-0.181	-2.1	-0.192	-2.3	
TIME	-2.801	-6.6	-2.773	-6.8	
EDATO	0.171	+2.2	0.114	+2.8	Yes
POP	0.386	+2.7	0.342	+2.4	
M/ED	0.336	+0.9	deleted		
M/WG	-1.690	-2.1	-1.345	-1.9	
%INC	-1.155	-2.0	-0.337	-2.3	Yes
CONSTANT	2.886		2.833		
		.56		.58	

2. Although the size of county as measured by population size has a positive effect upon the likelihood of success, variables indicating economic growth (median wage and income growth rate) have a negative affect.

3. Time since date of the loan is the most significant of all variables, and is negatively related. This is undoubtedly reflective of the fact that firms have increased likelihood of failure the longer they are in existence (80% of all new firms in the United States fail in the first five years).

The next type of analysis of factors underlying the success probabilities of EDA loan-recipient firms was discriminant analysis.[*] Because the firm status grouping that was to be predicted by the discriminant function was the same as that used as the dependent variable in the regression analysis (success or failure) the results of this analysis essentially mirrors that of the preceeding. Nevertheless, the form of the estimated result is clearly more useful for policy purposes than that of the regression analysis, since the discriminant function unambiguously states whether a given firm is expected to succeed or fail, while certain difficulties becloud the interpretation of the regression result.[**] The results of the analysis are shown in Tables 3 and 4.

---

[*] Given a set of observations belonging to one of two groups (the set of firms belonging to the success or the failure group), discriminant analysis estimates a function, as a linear combination of the attributes of the observations that best serves to predict which of the two groups an observation is expected to belong.

[**] The predicted value of the (0,1) regression may easily exceed unity or take on a negative value, a result inconsistent with the probability interpretation of the dependent variable. See David Durand's application of discriminat analysis to discriminate between good and bad consumers installment loans, in G. Fintner, Econometrics, New York: John Bailey, 1952. Original reference is D. Durand, "Risk Elements in Consumer Installment Financing", Studies in Consumer Installment Financing 8, NBER, 1941.

Table 3

Statistical Estimates of the Discriminant Function

Mahalanobis D^2	5.315		
Dividing Point	-0.2935		
Variable	Coefficient	Variable	Coefficient
SIC(1)	-0.042	ΔPOP	-0.003
SIC(2)	-0.049	MIG	0.030
ACT(1)	-0.025	M/ED	0.046
ACT(2)	0.000	%FEM	0.086
ACT(3)	0.005	M/AG	-0.015
EDATO	-0.385	M/WG	-0.242
EDAPR	0.023	%MG	-0.019
TIME	0.040	%INC	-0.169
POP	0.055	%PUT	-0.004

Table 4

Estimated Versus Actual Outcome

Estimated \ Actual	Succeed	Fail
Succeed	36	1
Fail	5	26
Total	41	27

Table 3 gives the coefficients of the variables in the discriminant function as well as a measure of its ability to utilize these variables as the basis for discriminating between success and failure (the Mahalanobis D^2) failure. The dividing point between success and failure is also provided. In Table 4, the estimation of whether each firm would have been expected to succeed or fail, based on the underlying factors, is shown, grouped according to the actual success or failure outcome for the firm. Five of the 41 firms that succeeded were "predicted" to fail, while only one of the 27 firms that failed was expected to succeed.

B. Analysis of the Determinants of the Degree of Success

In this section, ordinary least squares regression will be applied for identifying the variables that are significantly related to the degree of success, given of course, that the firm did not fail. Two analyses are made: the first analyzing the determinants of total wages paid* to employees of EDA loan-recipient firms (ΔY), and the second analyzing the number of employees* hired in each such firm (ΔE) since the date of loan approval. The independent variables included in both analyses are exactly the same as those used in the preceeding section (See Table 1).

The income change (ΔY) regression for all variables in their original (linear) form provided an R^2 of .74**, with ten significant variables, as

_____

* These measures are obtained from the survey of Chilton Research Services, Inc., and are "blown-up" to reflect the total employment from each firm.

** Not corrected for degrees of freedom.

shown in columns 1 and 2 of Table 5. Based upon this analysis, as well

as a number of analyses made with varying logarithmic transformations

of the variables, it was decided to use a semi-log transform of the

regression equation (taking the logarithm of the dependent variable only),

implying that the true form of the function is exponential (i. e., $\Delta Y =$

$e^{b_1 x_1} e^{b_2 x_2} \ldots e^{b_n x_n}$). The results of this analysis, where all variables but

three (TIME, ΔPOP, and M/AG) entered, indicate high predictive power

for the relation, with $R^2 = .85*$, as shown in columns 3 and 4 of Table 5.

Ten variables were found to be significant ($t \simeq 2$). Because only 33 ob-

servations could be included in the analysis, it was necessary to reduce

the number of variables in the regression. Removing four additional

variables from the regression (ACT(2), EDAPR, %FEM, and M/WG)

provides an R^2 of 80, * with nearly all the included variables being

significantly. The findings of this semi-log regression were as follows:

1. Neither the firm classification (ACT_j) nor the degree of poverty

in the county were significantly associated with the degree of success.**

2. SIC type made a difference, with the resource-oriented industries

having a small advantage over the labor-oriented industries, and almost

certainly over the recreation-oriented industries, which, while necessarily

---

* Not corrected for degrees of freedom.

** This is in addition to the other deleted variables, including time
since loan, EDA percent participation, the three environmental character-
istics of average age, wage and percent female, and the population change
measure which was collinear with the migration measure.

TABLE 5

Regression with ΔY as Dependent Variable
Number of Observations: 33

Variable	No Transform coefficient	No Transform t-value	Semi-Log Transform coefficient	Semi-Log Transform t-value	Semi-Log Transform coefficient	Semi-Log Transform t-value
SIC (1)	0.050	+0.2	1.118	+2.1	1.495	+3.2
SIC (2)	0.091	+0.3	0.837	+1.6	1.285	+3.0
ACT (1)	-1.037	-3.2	-0.989	-2.0	-0.142	-0.4
ACT (2)	-1.238	-3.8	-1.074	-2.0	deleted	
ACT (3)	-1.230	-3.7	-1.330	-2.5	-0.468	-1.3
TIME	-0.421	-0.7	deleted		deleted	
EDATO	0.112	+0.8	0.700	+3.5	0.654	+3.3
EDAPR	2.358	+1.6	3.017	+1.3	deleted	
POP	-0.295	-1.3	-1.375	-4.2	-1.438	-4.7
ΔPOP	0.016	0.0	deleted		deleted	
MIG	-0.134	-0.1	-1.806	-2.2	-1.453	-1.8
M/ED	2.508	+2.5	6.448	+3.9	5.795	+3.9
% FEM	-1.357	-0.6	3.645	+0.9	deleted	
M/AG	0.803	+0.4	deleted		deleted	
M/WG	0.985	+0.5	-2.909	-.9	deleted	
% MG	1.903	+1.8	5.668	+4.3	5.899	+4.5
% INC	-0.767	-0.6	-5.776	-3.0	-3.821	-2.3
% PUT	1.413	+1.2	1.781	+1.0	1.836	+1.2
CONSTANT	-3.210		-11.775		-10.117	
R^2 *	.74		.85		.80	

*Uncorrected for degrees of freedom

deleted from the regression, almost certainly would be negatively
associated with the success measure.

3. Size of loan is significantly associated with the success measure
in a positive exponential relation as shown on curve segment AB in
Figure 3. This finding, derived as "part of the package" of the overall
multi-variate regression, indicates that the benefit-cost ratio increased
as size of loan increases but this pattern must reach diminishing re-
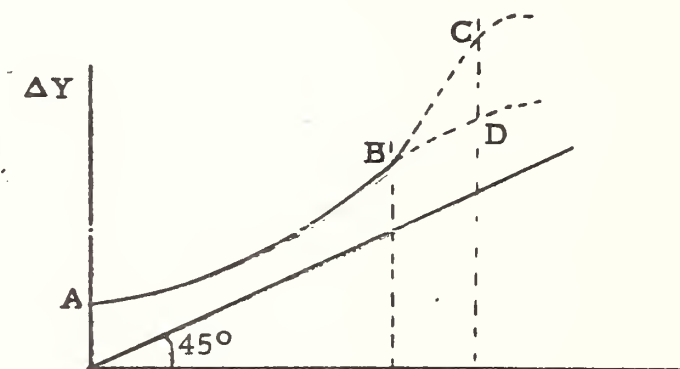turns at same scale of loans.

Figure 3: Relation of Size of Loan to Size of Loan Payoff

However, the evidence indicates that diminishing returns do not set in
until some point beyond the largest loans of those included in this study.
Although most of the observed EDA loans undoubtedly lie on curve segment
AB, the statistical technique used in this analysis is not sufficiently re-
fined to identify whether the curve begins to tail off at its upper point,
continuing onto segment BD, or continues its increasing path onto segment
BC. An attempt to clarify this for purposes of identifying the optimal
size of loan implied in the data is presented in Chapter 6 of this study.

4. As might be expected, the size and quality of the county labor force has an important impact upon the magnitude of success.* Both the educational attainment of the labor force, and the proportion of the labor force in manufacturing occupations are very significantly and positively associated with degree of success.

5. Quite surprisingly, the degree of success is inhibited rather than enhanced by community size and growth. Larger populations, and higher income growth rates along with net immigration, are associated with a smaller degree of success as measured by the aggregate payroll of the loan-recipient firm. This finding, which has important implications for the "equity versus efficiency" controversy,** is shown in all three regressions of Table 5 is consistent with the negative impact of community economic growth upon success of loans. It is further supported by noting that Table 2 shows that lower wages, together with higher education (indicating labor force quality), enhances loan success. However, Table 2 indicates that the size of population enhances the probability of success, in contrast to its dampening effect on the magnitude of success shown in Table 5. These findings indicate that industries thrive in pro-

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* This result was also indicated in a recent report by CONSAD Research Corporation, A Study of the Effects of Public Investment, for the Economic Development Administration, 1969, Chapter III.

** A number of economists have argued that loans in higher growth centers will be more efficient, but that since the declining areas are thought to be in greater need, are counter-equity. But the evidence here indicates that loans to declining areas are both equitable and efficient. In discussion with a consultant to the pulp and paper industry, Mr. Meyer Hyman, a locational rationale for industrialists considering location in relatively rural regions is the existence of a sizeable and experienced labor force in residence. This labor force often includes a large number of out-commuters formerly employed in a now defunct local industry, and can be identified through simple survey techniques.

tected environmental situations, where a good labor force is available and where other industries are leaving thereby reducing the competition for this labor force and, of course, easing the pressure on wages. However, firms located in larger towns, again in a declining situation, are less likely to default on the loan.

Attention now turns to the analysis of the determinants of employment change in EDA loan-recipient firms. The application of least-squares regression to all variables in linear form yielded poor results, with an R^2 of only .48 as shown in columns 1 and 2 of Table 6. After several tests with varying logarithmic transformations of the variables, the most appropriate form of the equation was found to be exponential (semi-log transformation, log of dependent variable only) as in the preceeding (ΔY) equation.

Eliminating three variables from the regression (SIC(2), TIME, and %FEM), an R^2 of .72 was obtained. Once again, however, the scarcity of observations (36) necessitated further reduction in the number of variables, and another four variables were therefore deleted (ΔPOP, MIG, average wage and age). The resulting semi-lag regression provided an R^2 of .67. The pattern of results in terms of the significance of the included variables is similar to that found in the ΔY regression, with two exceptions:

1. Firm classification, rather than SIC-type has a significant effect upon employment. New firms receiving EDA loans contribute less to employment objectives than other types.

TABLE 6

Regression with ΔE as Dependent Variable
Number of Observations: 36

Variable	No. Transform		Semi-Log Transform		Semi-Log Transform	
	coefficient	t-value	coefficient	t-value	coefficient	t-value
SIC (1)	0.099	+0.1	.572	+1.5	.388	+1.2
SIC (2)	-0.075	-0.1				
ACT (1)	-1.968	-0.1	-1.362	-2.2	-1.531	-2.6
ACT (2)	-2.121	-1.6	-1.157	-1.6		-1.4
ACT (3)	-1.532	-1.3	-1.237	-1.9	-1.215	-1.9
TIME	-0.126	-0.1				
EDATO	0.153	+0.3	.581	+2.3	.481	+2.0
EDAPR	3.706	+0.7	3.022	+1.3	2.883	+1.3
POP	-0.593	-0.6	-1.263	-2.8	-1.127	-3.0
ΔPOP	7.696	+0.8	5.858	+1.3		
M/G	-7.537	-0.8	-7.091	-1.5		
M/ED	6.679	+1.7	5.235	+2.5	5.243	+2.6
% FEM	-8.196	-0.9				
M/AG	6.384	+0.8	4.784	+1.3		
M/WG	-0.729	-0.1	-2.605	-0.8		
% MG	8.331	+2.1	7.395	+3.7	6.654	+4.3
ΔINC	1.574	+0.3	-5.264	-2.3	-4.251	-2.1
% PVT	4.750	+1.0	3.457	+1.3	4.641	+2.5
CONSTANT	-10.046		-11.054		-9.251	
R^2	.48		.72		.67	

2. The degree of poverty has a favorable effect upon the degree of success in terms of employment generated by the program. This finding is in keeping with the "protected environment" finding of the ΔY analysis.

C. Conclusion

Techniques of multivariate statistical analysis were applied to the identification of factors underlying (1) the probability of success and (2) the degree of success. Three classes of determining variables influencing both types of success were selected: characteristics of loan-recipient firms; characteristics of the loan; and socio-economic characteristics of the county in which the loan-recipient firm was located. All three types of variables were found to significantly affect success, although in differing ways.

The probability of success was found to be favorably influenced by larger loans, larger populations, and lower-wages, and negatively influenced by conditions of economic growth, by time, and by such characteristics of firms as new entry, and resource orientation. A discriminant function was calculated to provide a means for estimating the success likelihood of future loan applicants.

The magnitude of success as measured by income was found to be favorably influenced by size of loan, by firms that are resource-oriented (an effect opposite that in the success probability case), and by labor force

quality characteristics including higher educational attainment and higher proportions of manufacturing occupations.

Factors inhibiting the level of income generated by loan-recipient firms include an environmental situation characterized by higher growth rates, higher out-migration rates, and higher populations. This pattern is repeated when the level of employment generated by firms is analyzed with the addition that community environments characterized by a higher degree of poverty are also a significant element of a highly favorable and protected labor force climate for firms who can gain a degree of monopsony with respect to hiring.

VI. EVALUATION OF THE EDA BUSINESS LOAN PROGRAM

A. The Selection of Evaluation Criteria

Traditionally, program evaluation has been carried out using the techniques of cost-benefit analysis. In such analysis, a program may be said to be acceptable if the ratio of its social benefits to its social costs exceeds unity.

In a recent study of the EDA Business Loan Program, * a series of benefit-cost ratios were calculated (under various assumptions) and the worth (benefit-cost ratio) of the program was estimated to be no greater than 25 to 1 and no less than 12 to 1. The said study, which was extremely thoughtful about contingencies arrived at these promising figures by employ- ing a thorough cost-benefit procedure which entailed estimation of the cur- rent value of the entire future income stream that could be expected to be generated by the loan-recipient firms. These estimates were then divided by the entire cost stream absorbed by the program in terms of EDA budgets and the social opportunity costs of same.

Given such a worthwhile program and these high estimates of net social benefits, it is somewhat puzzling that net private benefits would not be at least as great as the interest rate, and high enough to attract more private activity than exists. The problem,

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* Stanley Miller, D. Gaskins, and Charles Liner, <u>Evaluation of the AKA-EDA Loan Program</u>, Office of Economic Research, Economic Development Administration, November, 1968.

of course, is in the selection of items to be included in the benefit stream. The Miller-Gaskins-Liner study included all expected payrolls and multiplier effects discounted over an infinite time horizon. A question might be raised as to whether all payrolls should be included or whether only those paid to employees hired after the date of the loan approval are relevant. Although many employees hired after the loan would be as replacements for pre-loan labor, the least that should be done would seem to be to exclude personnel obviously not part of the loan-induced expansion. A number of additional offsetting factors were considered in the MGL Study, but these were either heavily discounted or dismissed. Among the mitigating factors so considered were:

1. The likelihood that the firms would have located in target areas without the EDA loan and, in addition, that even if the firm did not locate there, some growth would have occurred anyway;

2. The evaluation of benefits in terms of the achievement of specific program goals, such as the income incident to poverty populations.

These two points are indeed critical to the evaluation; but having once raised them, the MGL Study dismisses the first as unlikely and presents a worthy but unsupported argument against the second, allowing for as little as zero or as much as fifty percent reduction in benefits, still leaving a 15 to 1 or 6 to 1 benefit-cost ratio.

The first point can be summarized as "the likelihood that growth would have occurred even without the EDA loan." The nature of the industries receiving loans is that their location decisions are almost always

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dependent upon supply rather than demand conditions at alternative locations.
This being the case, there must be an external, or national, demand that
these firms can serve from the candidate locations. A firm influenced
to accept a location in a depressed area as a result of an EDA loan, there-
fore, would likely have located in another area, with much the same output
level, without the loan. This would not be true if all EDA loans were, in
fact, loans of last resort. In this case, the loan can be considered a subsidy,
having the effect of reducing marginal costs of production and thereby increas-
ing aggregate output, depending upon the opportunity costs of the subsidy.
Treatment of this question lies beyond the scope of the present study -- there
is no way to assess the likelihood that the loans are loans of last resort. But
even if they are not, the success of the loan in influencing such firms to lo-
cate in depressed areas contributes to the specific goal of poverty reduction
in target areas. This, however, does not satisfy the question of whether the
loans have generated a net increase in social benefits or, in the words of
the MGL Study, "personal income streams foregone by society (relative)
to the personal income generated in the designated area."* It may be that
the loans contribute nothing to net social product. In this case, according
to the MGL Study criteria, the loan program should be discontinued. But
many federal programs such as EDA are not established to contribute to the
GNP but, rather, to achieve certain social goals (even at the expense of the
GNP). It could be argued that the minimization of employment through govern-
ment programs would entail an inefficient use of national resources with

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* *Ibid.*, page 22.

respect to the "GNP maximization" criterion. The point being made here is that legislated programs should be evaluated in terms of the achievement of specific goals, whatever they may be, rather than in terms of the traditional cost-benefit criterion. Thus, to influence firms to locate in depressed areas -- toward the end of achieving a legislated goal -- may be worthwhile strictly in these terms, even if those firms would have generated equivalent income, without the loans, through location in other areas. The evaluation criterion implied in a goal-oriented procedure is similar to that of cost-effectiveness analysis, where in measures of effectiveness are stated along a different dimension than are measures of cost. The approach essentially makes program evaluation meaningless in the absence of alternatives against which to draw comparisons, although, in fact, a review of the applications of the more traditional cost-benefit approach suggests the same conclusion. Nevertheless, a body of evaluations and underlying data is currently being developed in the area of economic development programming* and the time is near at hand when a consistent set of evaluational data will be available for comparing a series of program alternatives. The present study should be treated in this context. For this reason, the data to be presented in this chapter will be along a scale consistent with that used in the Miller-Gaskins-Liner Study, as well as along scales that are necessary for several types of cost-effectiveness analysis that may be necessary if several different types of programs oriented toward economic development are to be compared.

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* Office of District and Area Planning, Economic Development Administration.

At this point, attention may be given the treatment accorded by the MGL Study to the second question raised above, that of program evaluation in terms of goal achievement. In the present program, the legislation states that the reduction of unemployment and of poverty in depressed areas are specific goals to be pursued by EDA, although it broadens the goal set by stating that the achievement of a general employment increase toward "economic development" is also an objective.* The MGL Study notes that if the criterion is redefined as "income increases to the unemployed and underemployed," then it "should not change matters if one assumes that jobs vacated by workers formerly employed and now working in ARA and EDA-assisted plants will, in most cases, be filled by the underemployed, unemployed, or by workers moving internally or from other firms, and thus vacating jobs for the unemployed, underemployed, and non-labor force members."**

This argument, which is certainly reasonable, provides the analyst with a rationale for assuming that those program impacts reaching any group will be equivalent to the impact that reaches the target group. Thus, for example, suppose that, out of a total wage bill of $500,000, only $100,000 in annual earnings were paid by loan-recipient firms to the for-

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* Public Law #90-103, The Public Works and Economic Development, Act of 1965, as amended.

** Miller, Gaskins, and Liner, op. cit., page 21.

merly unemployed, with the remaining $400,000 being paid to people formerly

employed in other firms. In this case, then, instead of crediting the loan

program with only $100,000 in direct current benefits, the assumption

that the trickle-down effect will operate to generate jobs for the unemployed

equal in number to the jobs provided by the loan-recipient firms to the

formerly employed makes it possible to credit the loan program with the

entire $500,000. Given that the gain is 400%, the assumption is certainly

worthwhile. But, before examining the empirical evidence on the size of the

gain provided by the assumption (the MGL Study pegs it at 100%), there

should be considered the empirical evidence concerning the assumption itself.

    In a recent CONSAD study, * data on unemployment, ** employment,

and labor force changes in a large number of rural counties over the period of

1963-66 were analyzed, taking account of local factors related to migration and

labor force participation, to determine the average county-wide unemployment

change associated during this period with a unit employment increase. It should

be noted that in a closed economy with no labor force change, a unit increase

in employment would result in a unit reduction in unemployment. The analysis

showed that a unit increase in employment has been associated with an average

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    * CONSAD Research Corporation, A Study of the Effects of Public
Investment, prepared for The Economic Development Administration,
1969, Chapter IV.

    ** Unemployment includes only those counted as participating in the
labor force. The data used was obtained by State Bureaus of Employment
Security.

of .11 decrease in unemployment, migration and labor force participation considered, or that approximately ten new jobs are required to cause county-wide unemployment to drop by one. Clearly, for the MGL hypothesis to hold, it must be assumed that 1) new jobs absorbed by new labor force participation are just as valuable to EDA as the jobs that would otherwise have been absorbed by the local unemployed -- an assumption which may or may not be warranted, but that in any case begs the question -- and 2) jobs in other counties, vacated by the in-migrants who absorb the new local jobs, do not disappear but instead go to the unemployed of those counties.

To consider these assumptions, let us review the data shown in Chapter II of this study. Of the 1,817 new jobs provided by the 40 loan recipient firms, 196 or 11 percent went to people who were formerly unemployed -- a figure precisely matching that found in the earlier CONSAD study. But here, data is available for explicitly considering the direct migration effects. Only four percent of the previously unemployed had in-migrated from another country; only six percent of all full-time employees were in-migrants. Evidently, in-migration accounts for but a small proportion of the immediate employment effect; and, given the superior visibility to a dispersed labor force of a new plant being constructed in a rural area, it would seem that this in-migration rate would be higher for the immediate effect than for the local firms involved in the secondary trickle-down (or "musical-chairs") effect. Yet, it is conceivable that the "musical-chairs"effect, even with a declining in-migration rate (combined with the 11% unemployment reduction rate)could result in an unemployment reduction equal to the immediate

employment increase. Far more likely, however, are the two other possibilities, the second of which must be stressed:

1. Many of the jobs will be taken up by new labor force entrants; which are not counted.

2. Many of the jobs will disappear due to the resulting scarcity of labor, i.e., the musical-chairs effect will be truncated.

The first of these, of course, accounts for a significant portion of the immediate employment in the loan-recipient firms (11%), and while most of these jobs benefited people who are not heads of households (82%), they might well be considered a contribution to goal achievement even though preferred program incidence would be upon previously unemployed heads of households.

The second effect is an absolute contraction in employment in the local firms that lost labor to the new plant. This effect has long been a focus of interregional trade theory, although one generally ignored in regional growth economics.

To see this effect, consider Figure 1, in which the local labor demand function (DD) is shown to have shifted rightward (D'D') as a result of the entry of the EDA-assisted plant.
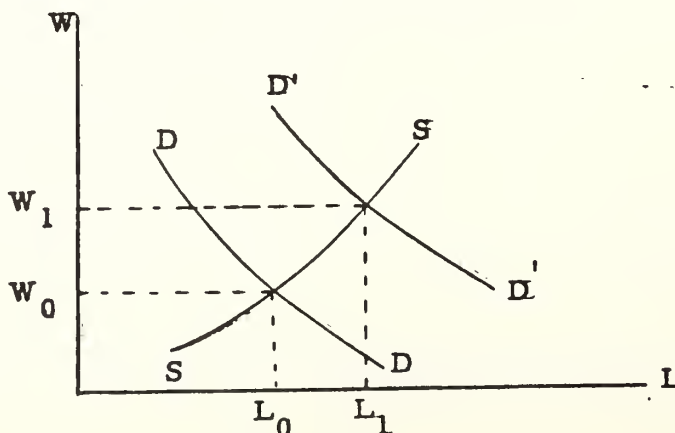

Figure 1: Effect of New Entry Upon Local Wage Rate

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Now, assume that a local wage change affects the local labor sup-
ply function (SS) by affecting labor-force participation decisions only
and, further, that migration has the effect of shifting the labor supply
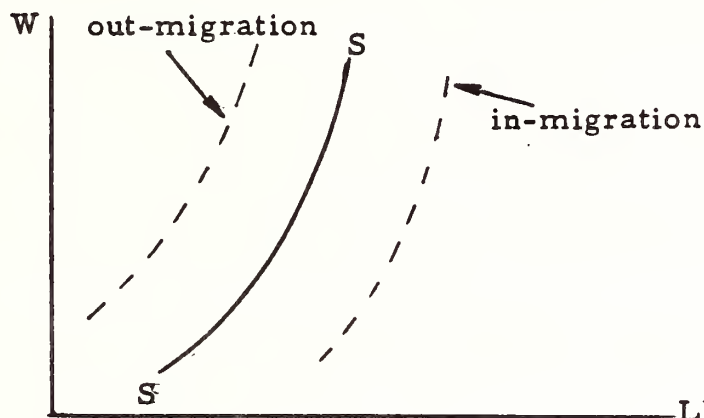schedule, as shown in Figure 2.

Figure 2: Effect of Migration Upon Local Labor Supply Function

Next, assume that migration is also a function of the local wage
rate. Then, as the local wage rate increases assuming wages in other
regions to be constant, the local labor supply function shifts rightward, as
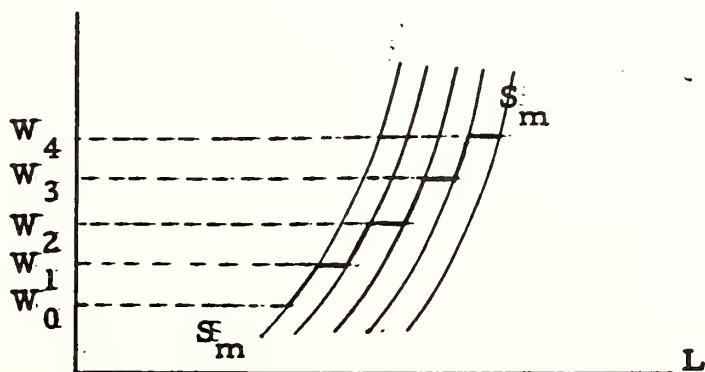shown in Figure 3. It is thus possible to trace the cross-cut migration-sensitive

Figure 3: Migration-Sensitive Labor Supply Function

labor supply curve $S_m S_m$. Attention is directed to the elasticity of this cross-cut supply curve.

If the migration response to wage rate shifts were perfectly responsive, then the cross-cut supply function would be infinitely elastic. An increase in labor demand of ΔL due to new entry would result in an equilibrium employment of $L_0 + \Delta L$, or L_1, as shown in Figure 4.
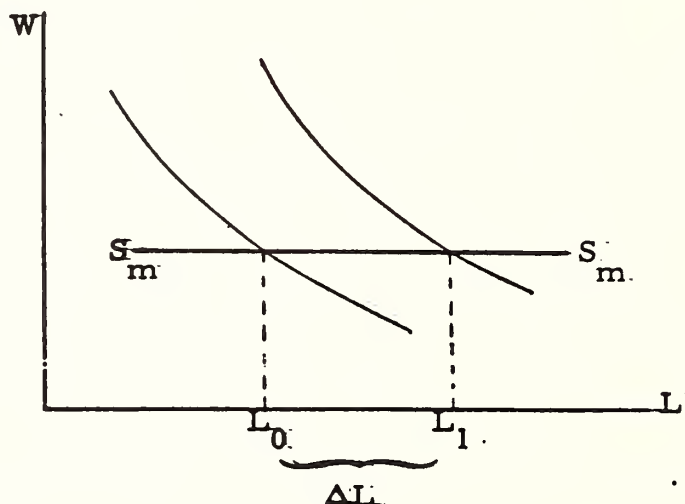

Figure 4: Equilibrium Local Employment Assuming Infinitely Elastic Migration-Sensitive Labor Supply Function

But in depressed areas where strong out-migration patterns exist and where perfect mobility in response to economic conditions is not typical, it is unrealistic to assume that the in-migration response will be such as to assure a perfectly elastic cross-cut labor supply function. A more credible assumption is that of a less-than-perfectly elastic supply function, $S'_m S'_m$ of Figure 5. Then, a shift in the labor demand function due to new entry of a firm employing ΔL workers will result in an equilibrium employ-
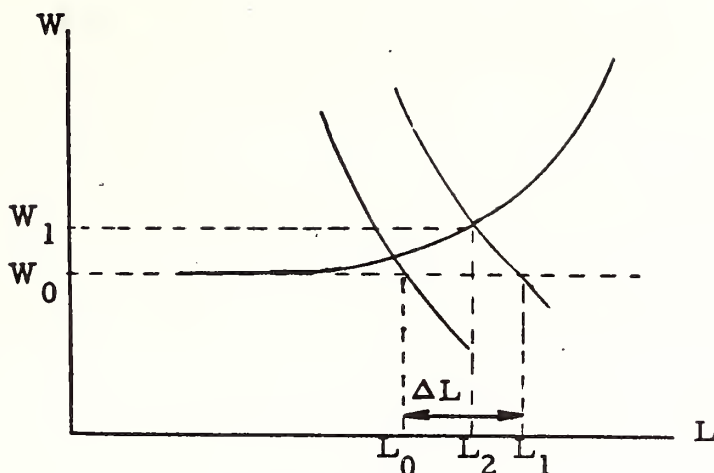
ment level of $L_2 < L_1$.

Figure 5: Employment Equilibrium With Less-Than-Perfectly Elastic
Labor Supply Function

If the new entry is able to retain its entire employment requirement
of ΔL as the wage rate increases from W_0 to W_1, then employment in
local pre-existing firms will contract by an amount $L_1 - L_2$.

Evidence for this effect is to be found in Chapter IV of this study,
in which the degree of program success in generating employment and
income increases was shown to be adversely affected by local conditions
acting to increase the competition for county labor.

From this discussion, it should be clear that the "musical-chairs"
assumption cannot be accepted at face value. In the same vein, the assump-
tion that unemployment reduction among the target population will rise to
equal the aggregated immediate employment impact is likewise unaccept-
able. Instead, it will be necessary to explicitly consider the incidence of
program benefits upon each target population and with respect to each goal.

The evaluation of the Business Loan Program will be guided by this requirement. However, for purposes of comparison, the assumptions of the Miller-Gaskins-Liner Study will also be given, following the evaluation stated in terms of goal-achievement.

B. Program Evaluation with Incidence Criteria

Objectives of the Economic Development Administration include the reduction of poverty and of unemployment in depressed counties that meet the designation requirements (which include an unemployment rate of at least six percent or median family income of less than 40 percent of the national average). Program benefits in this section of the evaluation will therefore be based upon the degree to which these objectives are being achieved.

Three types of measures for program evaluation will be shown following the estimation of program benefits:

1. Current value of the gross increased income stream* to all groups;

2. Current value of the gross increased income stream incident to the poverty population divided by the current value of the cost stream, generated by the program;

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* A preferred measure would be the current value of the net income stream incident to the target population generated by the Loan Program, divided by the current value of program costs, where net income is the increase in earnings less opportunity costs.

3. The number of people for whom program goals are achieved (previously employed or earning less than $4000 per year) relative to the discounted value of the cost stream.

1. Benefit-Cost Evaluation in Terms of Income Impacts.

a. Benefit Estimation Based Upon Gross Income Change to all Groups - The total annual income earned in the 40 loan-recipient firms that were surveyed amounted to $7,747,600. Considering earnings from other sources both before and after hire, this represented an aggregate increase to all employees of $2,530,900. If the "musical-chairs" effect is entirely discounted, the direct aggregate benefit then amounts to the $2.5 million figure. The remaining $5.2 million being treated as the amount that would have been earned in the absence of the Business Loan Program. If, however, it is assumed that the "musical-chairs" effect is 50% effective,* then the direct aggregate benefit would amount to $5,039,250, as shown in Table 1.

Added to these direct income impacts are the indirect income impacts that result from the multiplier process. Using sectoral earning data for 90 counties** in which EDA and ARA Business Loans have been made (including the 40 firms surveyed), it was found that an exogenous change in county income of $100 would result in an addition of $86 earned in internal sectors (including county sectors serving consumer and interindustry demands). *** This represents a multiplier of 1.86. Applying this multiplier to the aggregate change in direct earnings, an aggregate direct and indirect earnings estimate of

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* Section B of this Chapter treats the contingency of 100% effectiveness.

** The sectoral earnings data was obtained from county estimates for 1962 and 1966 by the Office of Business Economics, Department of Commerce.

*** See equation (3') in Appendix B of this study.

Table 1

Direct Income Change Impacts

	"Musical-Chairs" Ineffective	"Musical-Chairs" 50% Effective
Aggregate Direct Change	$2,530,900	$5,039,250
Direct Incidence to Poor	$ 773,300	$1,542,010

$4,704,700 is obtained. Assuming the existence of a partial "musical-chairs" effect, the direct and indirect aggregate impact would be $9,368,000. These figures are shown in the first row of Table 2.

Insofar as these figures measure increased earnings to the unemployed, underemployed, the poor, and, in a broader sense, to the underutilized, they may be interpreted as the gross immediate contribution to program goals.

b. Benefit Estimation Based Upon Gross Income Change Incident to Poverty Population - Of the $2.5 million in direct aggregate benefits, 31 percent or $773,300 was earned by employees with incomes of under $4,000 per year. If this same proportion is applied to the $5.2 million figure, the benefits incident to the poor amounted to $1,542,000. These figures are shown in columns 1 and 2 of Table 1.

A question now arises as to the incidence of the direct and indirect effects upon the poor. It is tempting to apply the ratio of poor to aggregate earnings (.31) to the indirect effects and thereby to obtain the low income multiplier effect, but to do so would be highly misleading because, as further reflection would indicate, the incidence distribution of the indirect effects would depend largely upon the structure of the county economy and only to a small extent upon the distribution of the direct benefits by the loan-recipient firms. In fact, since it might be guessed that the ratio of entrepreneurs to total employees in the consumer sectors would be relatively high, it would seem that the higher income groups of the county economy would gain a larger proportion of the indirect impact than of the direct. Partitioning the county income groups into low (less than $4,000), high (over $10,000) and middle income, a matrix multiplier was developed to explicitly treat this effect. *

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* The incidence multiplier is described in detail in Appendix A.

Table 2

Direct and Indirect Income Impacts

	"Musical-Chairs" Ineffective	"Musical-Chairs" 50% Effective
Aggregate Direct and Indirect Change	$4,704,700	$9,368,000
Direct and Indirect Incidence to Poor	$1,157,460	$2,332,600

While the high income group earned 12 percent of the direct impacts, it earned an estimated 31 percent of the indirect impacts, * or 2-1/2 times its direct impact rate. Faring less well in the outcome was the low income group, which earned but 16 percent of the indirect impacts, or one-half its direct earnings rate. Applying these derived percentages, the direct plus indirect program impacts incident to the poor amounted to $1,157,460. Assuming the partial "musical-chairs" effect, the direct and indirect impacts to the poor would be $2,332,600. These estimates are shown in row 2 of Table 2.

These estimates provide the annual income impact generated by the EDA loan program. However, it may be assumed that these benefits will be generated by the EDA loan-recipient firms into perpetuity.

In the Miller-Gaskins-Liner Study, the effects of the real growth of the economy upon the benefits generated by the loan recipients was considered by assuming that these firms would experience a growth rate of either zero or two percent per year, and that a discount rate of either 4, 6, or 10 percent could be assumed. Here are considered only the two percent growth rate (x) and a low discount rate (4) of 6 percent and a high of 10 percent. (4% discount rate is currently unrealistic.) Inserting these parameters into equation 1, two alternative current values of the future benefit stream (Y_K) may be estimated for the figures in Table 2. The results are shown in Table 3.

$$Y_K = \int_b^\infty Y \, e^{(x-r)t} dt \quad **$$

These benefits must now be divided by the current value of the cost stream arising from the Business Loan Program to obtain the measure of program performance.

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* These percentages are obtained from Chapter II of this study. They are applied to the matrix multiplier (Appendix A) to obtain the incidence distribution of the multiplier effect.

** In the MGL Study, the benefits generated in the first six years were ignored due to lack of data.

Table 3

Current Value of Future Benefit Stream

Discount Rate	6%		10%	
"Musical-Chairs"	None	50%	None	50%
Aggregate Benefit	$85,507,922	$170,263,400	$35,405,322	$72,489,584
Benefits Incident to Poor	$21,036,836	$ 42,395,005	$ 8,956,425	$18,049,658

c.   Estimation of Program Costs - Program costs are comprised of (1) losses due to default on loans, (2) administrative costs, and (3) the social opportunity costs of pre-empting the private sector from seeking its own highest use of the funds. As in their benefit estimates, the Miller-Gaskins-Liner Study provides several cost-estimates -- low, high, and reasonable. Since the low estimate made use of a 4% discount rate, which is unacceptable, only the assumptions used in the high and the "reasonable" cost estimates need be considered here.

The high, or most conservative, cost estimate as calculated in the MGL Study is based upon an estimated default loss rate of 18 percent of the disbursed loans, where returns from liquidated assets are included in the estimate. In addition, a discount rate of 10 percent is assumed.

Applying these assumptions to a total of $23,180,000 in loans to the 40 firms, default losses would amount to $4,172,400, administrative costs would amount to $2,874,102,* and there would be an interest cost of $6,082,769.** The combined discounted value of the cost stream generated by the EDA Business Loan Program in financing the 40 surveyed firms is therefore $13,129,271.

The "reasonable" cost estimate is based upon an assumption of a ten percent default loss rate and a six percent discount rate. Under these assumptions, default losses would amount to $2,318,000, administrative costs would amount to $3,921,795, and the interest cost would be $2,857,373, to give a combined total discounted program cost of $9,097,169.

d.   Benefit Cost Ratios Based Upon Income Change Impacts - It is now possible to calculate the benefit-cost ratios for program evaluation purposes. However, where benefits

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* Administrative costs were obtained by deriving the ratio of loans held by the 40 firms surveyed in this study to the loans analyzed in the Miller-Gaskins-Liner Study, and applying this ratio to the administrative costs obtained in the MGL Study.

** Prorated in the same manner as in deriving administrative costs.

are discounted at ten percent, costs are discounted at the same rate. Since costs, when discounted at ten percent, include an 18 percent default loss assumption, the benefit-cost ratio assuming a ten percent discount rate will be considered to be a <u>conservative</u> estimate. "Reasonable" estimates assume a discount rate of six percent, and a default loss rate of ten percent. For those reasons, four benefit-cost ratios are estimated based upon income change impacts incident to all groups, and four are based upon income change impacts incident only to the poor. These ratios are shown in Table 4.

For the case where benefits include impacts incident to all groups, the most conservative benefit-cost ratio estimated is 2.7, and the least conservative is 18.7.

For the case where benefits only include impacts incident to the poor, the most conservative benefit-cost ratio estimated is .7, which is less than unity, and the least conservative estimate is 4.7.

Since, for the first case, the benefit-cost ratio exceeds unity, the evaluation is clear. The benefits generated by EDA Business Loan Program exceed the costs.

For the second case, the most conservative estimate shows that costs exceed benefits. However, the traditional criterion that the benefit-cost ratio must exceed unity must not be taken at face value, since only benefits incident to the poor are included in the estimate. This should be taken to mean that impacts to the poor are accorded much greater value than impacts to other groups, since non-monetary social considerations are included in the valuation. Viewed this way, these benefit-cost ratios are seen as not truly comparable with ratios that do not include incidence criteria (as is true in the first case). Therefore, the criterion that the benefit-cost ratio exceed unity should not apply to the case where incidence of benefits is restrained. Instead, such ratios should be used for comparing alternative programs, using comparative goal achievement per unit cost as the criterion.

Table 4

Benefit-Cost Ratios Based Upon Income Change Impacts

Discount Rate	6%		10%	
"Musical Chairs"	None	50%	None	50%
Benefits to all Groups				
Conservative Estimate *			2.7	5.5
"Reasonable Estimate**	9.4	18.7		
Benefits to Poor				
Conservative Estimate*			.7	1.4
"Reasonable" Estimate**	2.3	4.7		

*Conservative Estimates assume a default loss cost of 18 percent on disbursed loans, and a discount rate applying to both costs and benefits of 10 percent.

**"Reasonable" estimates assume a default loss cost of 10 percent on disbursed loans, and a discount rate applying to both costs and benefits of 6 percent.

2. Evaluation Based Upon Number of People for Whom Program Goals Are Achieved.

In the preceeding evaluation, program benefits were measured in terms of income change and the distribution of income to low income groups (earning under $4,000). But this criterion is weak when goal achievement is being evaluated. Although it measures income delivered to the poor, EDA program goals are stated in terms of the reduction of poverty and of unemployment. Therefore, a more appropriate measure of program goal-achievement would be the number of people taken out of poverty (income increasing above $4,000 due to the loan) and off the unemployment rolls.

Of the 1,817 new jobs made available in the 40 loan-recipient firms, a net of 289 jobs raised the income of employees formerly in the poverty group over the $4,000 line. In addition, 196 jobs were obtained by individuals who were formerly unemployed. However, 139 of the latter jobs were obtained by individuals who previously were both poor and unemployed. Therefore, 346 jobs, out of a total of 1,817, either raised individuals out of poverty or out of unemployment, or both. Thus, the EDA program resulted in 346 cases of direct achievement of program goals, a success rate of 19%.

To the 346 jobs provided by the loan-recipient firms (the direct impact) must be added the jobs created by the indirect impacts generated by the multiplier process.

6.22

Applying the employment (and unemployment) multiplier described in Appendix B, a total of 2,601 jobs would be created, directly and indirectly as a result of the multiplier process, of which 294 would be obtained by the unemployed. Thus, the indirect impacts of the loan program would provide 98 jobs to the formerly unemployed, in addition to the direct impact of 196. Assuming that the ratio of total direct impact (on the poor or unemployed) to the direct impacts on the unemployed (346:196) will also apply to the indirect impacts, the total direct and indirect impact of the EDA Business Loan Program upon goal-achievement (number of people taken out of poverty or unemployment) would be 250.

It is conceivable that a two percent growth rate might be applied to this figure with the future resulting in addition to goal achievement being discounted as in the preceeding income analysis; but, for the sake of credibility, this procedure will be avoided. The 520 figure will be used as the program effectiveness measure.

In order to maintain the success rate into the future, the total future costs must be considered. The same two cost figures estimated for the preceeding evaluation will be used here -- a reasonable estimate of $9.1 million and a conservative estimate of $13.1 million. Based upon these figures, the cost-effectiveness ratio for the EDA Business Loan Program is estimated at $17,500 per man or, more conservatively, at $25,200 per man. These costs may be broken down into components, as shown in Table 5.

Table 5

Analysis of Program Costs per Unit Effectiveness

Component of Cost	Reasonable Estimate*	Conservative Estimate**
Default Loss	$4,458	$8,024
Administrative	$7,542	$5,527
Interest	$5,495	$11,698
Total	$17,495	$25,249

*Cost estimate based upon 6 percent discount rate and 10% default loss rate.

**Conservative cost estimate is based upon 10 percent discount rate and 18 percent default loss rate.

It should be made clear, at this point, that these cost-effectiveness ratios may be used only for comparing alternative programs intended to achieve the same goals. There is no way of determining whether $17,500 per man is too high a cost to pay or whether it is a bargain; since criteria for determining the "red zone" benchmark have not been presented. One way of obtaining such a benchmark, which unfortunately lies beyond the scope of this study, is to determine the dollar savings to society for taking an individual out of poverty or off unemployment. To do this would require estimation of the current value of the future cost stream saved society in terms of welfare payments, public housing, health programs, education, crime, mass disorders and property damage, and the like, for each individual taken out of poverty or unemployment. Also, new economic productivity of these individuals that had previously been denied the economy must be added to the other cost savings. If these estimates were obtained, the cost savings to society generated by the program on a per person basis would almost surely exceed the $17,500 per person in program costs.

Another measure of program effectiveness might be shown by noting that it took $23,180,000 in business loans to permanently reduce unemployment or poverty by 520, a loan cost of $44,500 per person.

C. Program Evaluation in Terms of Aggregate Impacts

In this section, a cost-benefit evaluation based upon the discounted total cost and total benefit streams will be shown. The purpose of this

approach is to provide a result comparable with that obtained in the Miller-Gaskins-Liner Study. In this sense, this section can be viewed as an extension of the MGL Study, the main difference being that 40 observations, rather than eight, are used for deriving the results and that this study excludes employees hired by loan-recipient firms prior to the date of loan approval.

The total direct annual impact of the EDA Business Loan Program, as measured by the income paid to the 1,817 employees of the 40 firms who were hired after the date of loan approval, was $7,748,000. Although 68 percent of the new employees were previously employed, and although only one-third of the $7.7 million represented an income increase, it is believed that the "musical chairs" effect will be complete -- the jobs released by the previously employed will ultimately be filled by members of target groups. Therefore, the entire $7.7 million will be counted as the direct program benefit.

Applying the multiplier of 1.859 to the direct benefit figure, the total annual direct and indirect benefit is estimated as $14,420,900. Assuming a two percent annual growth rate, and a discount rate of 6 percent, the current value of the infinite income stream is $262,099,858; with the same annual growth rate, but a discount rate of 10 percent, the discounted benefit stream is $111,449,400. These figures are in Table 6.

Table 6

Total Cost and Benefit Impacts
(Musical Chairs 100% Effective)

Direct Impact	$ 7,748,000
Direct and Indirect	14,402,900
Discounted Benefit Streams:	
at 6% rate	262,099,858
at 10% rate	111,449,400
Discount Cost Stream	13,129,271
Benefit-Cost Ratio:	
benefits discounted at 6%	41.26
benefits discounted at 10%	7.19

It can be seen that the benefit to cost ratio calculated by this method is extremely high: the lowest, at an assumed growth rate of two percent and discount rate of ten percent is 8, while the high (discount rate of 6%) is 20.

D. Conclusion

In this evaluation of EDA's Business Loan Program, it was found that:

1. By almost all counts, the program appears to make a worthwhile contribution toward achieving such economic development goals as the amelioration of poverty and unemployment. Approximately one-fifth of the jobs created served either to raise the income of an individual above the poverty level or to take an individual off unemployment.

2. While the cost of achieving this goal may appear high ($17,500 per individual formerly poor or unemployed), the several benefit-cost ratios that were obtained all exceeded unity, with one exception, and that being the estimate for the case where only income earned by the poor was counted as benefit and very conservative assumptions (ten percent discount rate, 18 percent default loss, no "musical-chairs" effect) were used. Therefore, this evaluation indicates that the EDA Business Loan Program is generating positive net social benefits for society.

VII. OPTIMAL SIZE OF LOAN

A major question for EDA policy is the size of loan that should be given. If the total loanable funds available in any one year to the EDA Office of Business Loans is fixed, then a policy of making small loans implies that a large number of loans would be made during the year, presumably over a widely dispersed geographic landscape. But if the policy is to provide large loans, then a fewer number of loans will be made during the year, although in a more concentrated geographic pattern in order to generate more jobs per loan.

Now, although jobs per loan may increase as size of loan increases, the annual number of loans that could be made under a fixed budget will be reduced. For this reason it is not at all clear that by increasing the size of loan, the total number of jobs generated by the fixed annual budget would be increased. Actually, if the number of jobs increase slowly as size of loan increases, then it may very well be the case that a policy of larger loans per firm would reduce, and not increase, the total annual number of jobs generated by the Business Loan Program. In fact, as shown in Table 1, the ratio of total annual wages paid out by the EDA loan recipient firms to the size of loan they obtained from EDA declines as size of loan increases (this is seen in the negative sign of the coefficient to EDATOT obtained through regression analysis of the 40 EDA loan-recipient firms surveyed in this study). This finding

Table 1

Dependent Variable - Income Per Dollar Loan*

Log of VAR	Coefficient	T-Value
SIC1	.513	1.47
EDATOT	- .621	2.72
60-POP	- .953	2.48
MIGRAT	-1.706	2.26
MEDED	3.327	2.47
FEMALE	9.409	2.17
M-WAGE	-5.206	1.62
LABOR	4.415	3.09
CH-INC	-6.681	3.01
CONSTANT	-6.005	
R^2	.6305	

* Definition of variables, see Table 1 of Chapter 5.

7.2

is strong evidence that as EDA loan size increases, the size of payoff as measured in number of jobs or total payroll increases proportionately less. However, this does not mean that smaller loans are preferred -- only that at some point, which may be greater than the present loan size, diminishing returns will set in. It is to the task of identifying that point that this analysis is addressed.

It is our hypothesis that the income generated by an EDA loan-recipient firm increases as size of loan increases. In addition, as loans become increasingly large, the rate of increase in income diminishes. Such a relation is shown in Figure 1. *

Income per Loan (Y)

$Y = f(L)$

inflection point: $\dfrac{\partial^2 B}{\partial L^2} = 0$
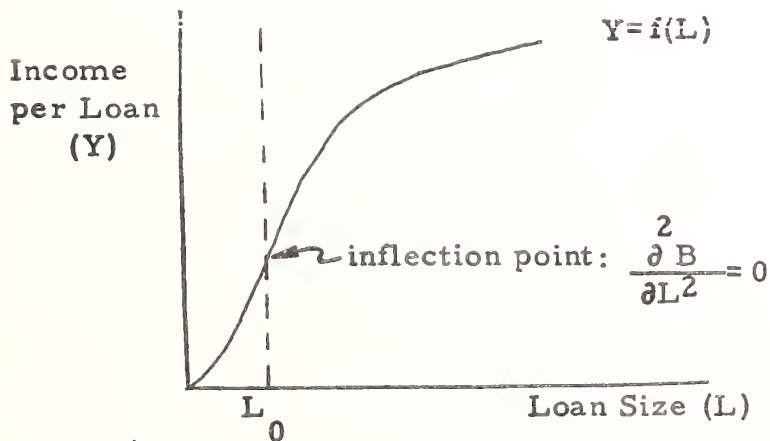
L_0

Loan Size (L)

Figure 1: Benefits Per Loan as a Function of Loan Size

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* Alternatively, these conditions may be stated as follows:

$$Y = f(L)$$

$$\frac{dY}{dL} > 0; \qquad \frac{d^2Y}{dL^2} < 0;$$

where Y is income per loan, and L is size of loan.

From the analysis of Chapter 5, it was found that aggregate program benefits (B), incidence not considered, could be stated in terms of the aggregate direct wage and salary income generated by each loan-recipient firm. This is done by first expanding the direct income impacts (Y) by the multiplier (β) to obtain direct and indirect impacts, and then expanding the result to account for impacts in all future periods, properly discounted. If our hypothesis that income is a function of size of loan (L) is correct, then aggregate program benefits may be stated as:

(1) $\quad B = \int_{0}^{\infty} \beta f(L) e^{(x-r)^{t}} \, dt,$

where x is the expected annual growth rate of loan recipient firms, r is the discount rate, and t is time period.

Another relation to be considered is that between program cost (C) and size of loan. It is assumed that program cost can be estimated as a linear and homogeneous function (a) of loan size. This linear cost function is shown together with the benefit function in Figure 2.
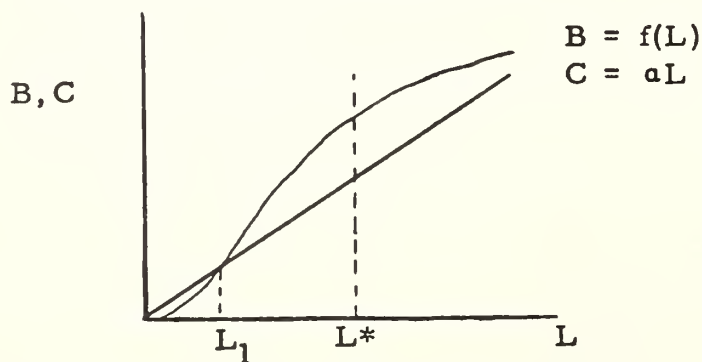

Figure 2: Program Benefits and Costs as a Function of Loan Size

In identifying the optimal size of loan, the objective will be to locate the point at which net benefits (Π), or the difference between program benefits and program cost is at a maximum. This may be done by stating the function for net benefits, in equation (2),

(2) $\Pi = \int_0^\infty \beta \, f(L) \, e^{(x-r)^t} \, dt - aL,$

and locating the highest point on that function, L*, as shown in Figure 2, and again in Figure 3.
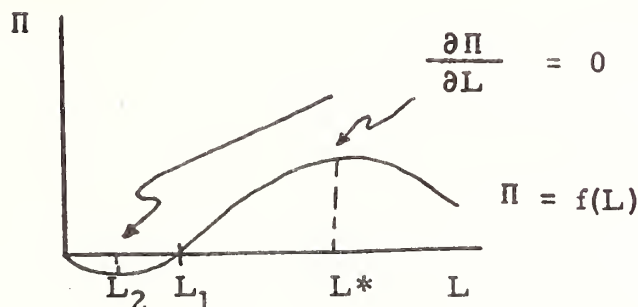
Figure 3: Net Benefits Stated in Terms of Loan Size

This may be done mathematically by taking the derivative of equation (2) with respect to loan size and setting the result equal to zero, thereby to obtain the point at which the slope of the net benefit curve is stationary -- neither rising nor falling. However, care must be taken to be certain that this is the maximum net benefit point (L*), and not the minimum point (L_2) by assuring that the second derivative is negative.

The task now confronting the analysis is to estimate the function

$$Y = f(L).$$

In Chapter 5   income impacts were analyzed in terms of three sets of causal factors: characteristics of the EDA loans, characteristics of

the firms, and characteristics of the locality in which the firms operate.
It was learned that size of loan did indeed have a positive and significant
impact upon income impacts. But it was also found that characteristics
of local economies, particularly those indicating that a loan-recipient
firm would have protected access to a good labor force, also significantly
favored the size of program impact. This, together with the observed
low but significant r^2 between the two variables (.20) provides suspicion
that the degree of the impact of the size of loan will depend upon factors
characteristic of the locality. It is tempting simply to make use of the
regression coefficient for the loan size variable as shown in Chapter 4,
since the multiple regression, using an exponential form, corrects for
confounding influences (so long as multi-collinearity is not present).
But the coefficient of this relation implies that impacts are increasing at
an increasing, rather than decreasing, rate as size of loan increases.
It is therefore necessary to focus upon the size of the coefficient and the
functional relation between size of loan, specifically, and income impacts.

To test the hypotheses indicated earlier in this chapter, it was
decided to make use of ordinary least squares regression upon alternative
logarithmic transformations of the variables. Two such transformations
were considered:

(3) $\text{Log } Y = a_1 + b_1 \text{Log } L + \epsilon_1$

and   (4) $Y = a_2 + b_2 \text{Log } L + \epsilon_2$

Equation (3) can be restated as:

(3') $Y = e^{a_1 + \epsilon_1} L^{b_1} = AL^{b_1}$

So long as $0 < b < 1$, and is significant, and $A > 0$, the hypothesis that income impacts increase at a decreasing rate as loan size increases is confirmed. In equation 4, the logarithmic transformation serves as part of the function itself, and follows a path that increases at a decreasing rate.

Both functions were estimated first via step-wise multiple regression, for the purpose of identifying the influence of local socio-economic factors upon the coefficient b_1. It was found that b_1 varied considerably as new variables were entered into the analysis, although well within the defined range ($.29 \leq b_1 \leq .60$). The highest t-ratio for b_1 in the step-wise regression was obtained with 15 variables included, with b_1 having a value of .56 and a t-ratio of 3.5. Since the instability occurred upon entry of the variable "median age in county" it was decided to estimate a simple regression between Log Y and Log L, with all observations deleted having a median age greater than the average for the entire sample leaving only 15 observations. This gives a b_1 value of .597, a t-ratio of 2.0, and an r^2 of .23. Because of the scantiness of observations in this test, it was decided to estimate the coefficients to equations 3' and 4 on unstratified data, providing 33 observations for the analysis. The results were as follows:

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$$(3') \qquad Y = \left[A L^{b_1}\right] 10^{(1-b_1)6}$$

$$= \left[.241 \, L^{.54)}\right] 10^{2.75} \quad ; \quad R^2 = .22;$$
$$(2.99)$$

$$(4) \qquad Y = \left[a_2 + b_2 \log(L10^{-6})\right] 10^6$$

$$= \left[.337 + .100 \log(L10^{-6})\right] 10^6 \; ;$$
$$(2.97) \qquad\qquad R^2 = .22.$$

The results for equation 3' provide estimates of b_1 substantially

similar to those obtained in the smaller sample, stratified tests, and

to those obtained in the step-wise multiple regression. Therefore, it

was decided to use the coefficients estimated for equations 3' and 4 as

shown above. *

The next step in the analysis was to estimate the linear cost

coefficient (a). In Chapter 5 of this study, two program cost estimates,

a reasonable and a conservative esti-nate, were provided based upon the

analysis made in EDA's Miller, Gaskins, Liner Study. * The reasonable

estimate of program cost for loans amounting to $23,180,000 was

$9,097,169, while the conservative estimate amounted to $13,129,271.

Dividing each program cost by the total loans disbursed gives the

_____
* Here, the size of the ratio of the control variable (size of loan) is the
statistic of interest, and t = 3 is acceptable. The size of R^2 is not a criterion
for acceptance of the model. The R^2 of .22 merely indicates that "size of
loan", as single variable, accounts for 22 percent of the variation in income
(Y). Many other variables, including the growth rate, wage, and quality of
labor supply as the firm's location, account for much of the remaining
variance of Y, as discussed in Chapter V. This is to say that while the
model cannot be used to forecast Y for an applicant firm, it can be used to
forecast, with confidence, the effect of "loan size" on Y

the following cost ratios as estimates of :

      Reasonable Cost Estimate: $a = .3925$

      Conservative Cost Estimate: $a = .5664$

The estimated parameters for deriving the optimal loan size are now available. Since two sets of coefficients have been provided for the benefit function and two for the cost function, four estimates of optimal loan size will be derived.

Inserting the coefficients of equations 3' and 4, and taking the integral from $t = 6*$ to $t = \infty$, equation 2 may be stated as follows:

$$(2.1) \quad \Pi_1 = \int_6^\infty 1.859 \left[.241 \, L^{.541} \, 10^{2.75} \right] e^{(2-r)t} \, dt - aL$$

$$(2.2) \quad \Pi_2 = \int_6^\infty 1.859 \left[.337 + .100 \ln (L \, 10^{-6}) \right] 10^6 \, e^{(2-r)t} \, dt - aL$$

Taking the derivatives of equations (2.1) and setting them equal to zero, the optimal loan size may be derived by solving for L:

$$(2.1') \quad a = \int_6^\infty 1.859(.541)(.241) \, L^{-.459} \, 10^{2.75} \, e^{(2-r)t} \, dt$$

$$(2.2') \quad a = \int_6^\infty .1859 \, L^{-1} \, 10^6 \, e^{(2-r)t} \, dt$$

The discount rate, r, will be set at the conservative value of 10 percent when the conservative cost estimate for a is to be applied, and

-----

    * Rather than using a lower bound of $t = 0$, the procedure will be followed that was applied in the MGL Study of ignoring the first six years of program benefits due to lack of data.

at the value of 6 percent when "the reasonable" cost estimate for

is to be applied.

The estimated loan sizes L* that maximize net benefits

according to the four alternative sets of benefit and cost coefficients

are shown in Table 2.

Table 2: Estimated Optimal Loan Size

Cost Function Benefit Function	Reasonable (.393)	Conservative(.566)
Exponential (Π_1)	$194,000,000	$13,618,000
Logarithmic (Π_2)	$ 8,637,500	$ 2,548,400

The average loan size during the 1962-1967 period surveyed in this

study amounted to $579,500. However, recent policy has been to approve

loans of a much higher amount -- $1 million or more per loan. Table 2

indicates that the recent policy is a step in the right direction.

Even admitting of the crude nature of this analysis, the most conservative

estimated optimal loan size is $2.5 million.

APPENDIX A

CALCULATION OF INCIDENCE MULTIPLIER

The income directly received by income group $\underline{i}$ in time $\underline{t}$ is equal to receipts from exogeneous sources (E) plus receipts from the local group $\underline{j}$ (assumed to be a constant proportion (p_{ij}) of the jth group's income (Y) in the preceeding period (t-1)). This can be stated as:

(1) $\quad Y_i(t) = \sum_j p_{ij} Y_j(t-1) + E_i(t)$

which is equivalent to:

(2) $\quad Y_i(t+1) = \sum_j p_{ij} Y_j(t) + E_i(t+1) \qquad\qquad i = 1, \ldots, n$

or, in matrix terms:

(2.1) $\quad Y(t+1) = PY(t) + E(t+1)$

We assume that $E(t+1) = E(t) = \overline{E}$, a constant. The purpose of this assumption is to represent the case in which the local economy experiences a permanent increase in the export sector of a constant amount such as might result from effective public development activities. In the second time period, equation 2.1 gives:

$$
\begin{aligned}
(2.2) \qquad Y(t+2) &= PY(t+1) + \overline{E} \\
&= P\left[PY(t) + \overline{E}\right] + \overline{E} \\
&= P^2 Y(t) + P\overline{E} + \overline{E} \\
&= P^2 Y(t) + \left[P + I\right]\overline{E}
\end{aligned}
$$

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Similarly,

(2.3) $Y(t+3) = PY(t+2) + \overline{E}$

$= P[P^2 Y(t) + (P + I)\overline{E}] + \overline{E}$

$= P^3 Y(t) + [P^2 + P]\overline{E} + \overline{E}$

$= P^3 Y(t) + [P^2 + P + I]\overline{E}$

By induction, it is seen that:

(2.4) $Y(t+n) = P^n Y(t) + [P^n + P^{n-1} + \ldots + P + I]\overline{E}$

As $n \to \infty$, equation 2.4 reduces to:

(2.5) $Y = P^\infty Y(t) + \left[\sum\limits_{t=1}^{\infty} P^t + I\right]\overline{E}$

Further, the infinite series in the bracketed term is solved as:

$$\sum\limits_{t=1}^{\infty} P^t + I = [I - P^\infty][I - P]^{-1} \text{ *}$$

Equation 2.5 can be restated as:

(2.6) $Y = P^\infty Y(t) + [I - P^\infty][I - P]^{-1}\overline{E}$

which solves for the income vector Y after the multiplier process has

converged. Attention now focusses upon the value of P^∞. If all

columns of P contain elements p_{ij} such that $0 \leq p_{ij} \leq 1$ and $\sum\limits_{i} p_{ij} < 1$,

then P reduces to zero. It will be shown below that these requirements

on the elements of P will be satisfied. This allows equation (2.6)

to be reduced to:

(2.7) $Y = [I - P]^{-1}\overline{E}$

---

* This can be derived by multiplying the term $\left[I + \sum\limits_{t=1}^{n} P^t\right]$ by $[I - P]$:

$[I - P][I + P + P^2 + \ldots P^n] = I - P^{n+1}$

Multiplying both sides by $[I - P]^{-1}$ and letting $n = \infty$,

$I + \sum\limits_{t=1}^{\infty} P^t = [I - P^\infty][I - P]^{-1}.$

We now consider the derivation of the matrix P.

Let the expenditures of income group i for commodity k be C_{ik}, i = 1, . . .,n and k = 1, . . . , s.

If these expenditures are a constant proportion of income then:

$$c_{ik} = \frac{C_{ik}}{Y_i} ; \qquad \begin{cases} i = 1, \ldots , n \\ k = 1, \ldots , s \end{cases}$$

Further, suppose that the proporting of goods imported from other regions (m_{ik}) can be identified:

$$m_k = \frac{M_k}{C_k} ; \qquad k = 1, \ldots , s$$

Over a small growth span, these import coefficients will be relatively constant, although as the region becomes large, import substitution will take place, reducing the size of the import coefficients. This effect will not be considered here. *

Subtracting m_k from one and multiplying by c_{ik}, the propensity to consume locally is obtained:

$$_L c_{ik} = c_{ik} (1 - m_k); \qquad \begin{cases} i = 1, \ldots , n \\ k = 1, \ldots , s \end{cases}$$

Next, the percent income distribution for each industry directly receiving the expenditures of local consumers (a_{ij}) is obtained:

$$a_{ij} = \frac{Y_{jk}}{Y_k} ; \qquad \begin{cases} k = 1, \ldots , s \\ j = 1, \ldots , n \end{cases}$$

---

* Another consideration is that import coefficients will vary by income group. Higher income groups will have higher propensities to import. This suggestes that the import coefficients should be differentiated by income group: $m_{ik} = M_{ik}/C_{ik}$.

This states that the probability that income group $\underline{j}$ earns income from industry $\underline{k}$ is constant, equal to the earnings of income group j employed in industry k divided by total earnings in industry k. However, not all of an industry's sales are spent on local wages and salaries -- much of it is spent on purchases of interindustry commodities. It is assumed that all interindustry purchases are imported -- supplied from outside the region. * Hence, to obtain the probability that a dollar of receipts in industry $\underline{k}$ will be earned by employees in income group $\underline{j}$, the a_{kj} coefficients must be adjusted downward to reflect the probability of interindustry purchases. To do this, the ratio (V_k) of value added to total purchases in industry k is obtained and multiplied by the a_{kj}:

$$\bar{a}_{kj} = a_{kj} \, \bar{v}_k, \qquad\qquad \begin{aligned} k &= 1, \ldots, s \\ j &= 1, \ldots, n \end{aligned}$$

Next, to obtain the probability $(_L p_{ij})$ that a dollar spent by income group $\underline{i}$ for local consumer goods is earned by local employees of income group $\underline{j}$, the $_L c_{ik}$ for a given income group $\underline{i}$ in each consumer sector are multiplied by the $_L a_{kj}$ coefficients and for income group $\underline{j}$ employed in each of the corresponding sectors, and summed over all sectors:

$$_L p_{ij} = \sum_{k=1}^{s} {}_L c_{ik} \; {}_L a_{kj}; \qquad\qquad i, j = 1, \ldots, n$$

---

* This simplifying assumption will not hold in industrialized and urbanized regions.

or in matrix terms:

(3) $\qquad _L P = {_L C}\ _L A$

Finally, noting that the $_L P_{ij}$ represent the probability that a dollar spent locally by income group i is locally earned by income group j rather than the reverse, we simply transpose the $_L P$ matrix to obtain the probabilities required to implement equation (2.7), the probability that income group j earns a dollar spent by income group i.

(4) $\qquad \dot{P} = {_L P}^T$

By substituting equations (3) and (4), equation (2.8) now reads:

(2.8) $\qquad Y = \left[I - ({_L C}\ _L A)^T \right]^{-1} \overline{E}$

which gives, as required, the total direct and indirect income earned by each of the various income groups of a region resulting from an increase in economic activity in the export sector. With this tool, the incidence of the regional income impacts of public programs may be estimated. The data required for estimating equation (3) is shown in Tables 1 through 6 as follows. The $[I - P]^{-1}$ inverse matrix derived from this data and to be applied to equation (2.8) is as follows:

$$\left[I - ({_L C}\ _L A)^T \right]^{-1} = \begin{bmatrix} 1.116 & .100 & .072 \\ .385 & 1.329 & .240 \\ .230 & .196 & 1.144 \end{bmatrix}$$

TABLE 1

Percent Distribution of Consumer Expenditures
by Commodity Type and Income Group*

Commodity Group / Income Group	1	2	3	4	5	6	7	8	Total*
$3,999 or less	.31	.19	.09	.08	.03	.11	.03	.16	
$4,000 - $9,999	.23	.14	.08	.08	.05	.08	.03	.15	
$10,000 - over	.14	.11	.07	.08	.05	.07	.03	.11	

* Source: Survey of Consumer Expenditures, 1960-61, U. S. Dept. of Labor.

** Commodity groups are as follows:

1. Food, tabocco, alcoholic beverages, 1/4 allocation of gifts and con-
   tributions.
2. Shelter, fuel, light, refrigeration, water, 1/2 allocation of gifts and
   contributions.
3. Household furnishings, operations, equipment.
4. Clothing, clothing materials and services, 1/4 allocation of gifts and
   contributions.
5. Personal insurance.
6. Personal and medical care, education and reading.
7. Recreation.
8. Transportation, other expenditures.

* Totals do not add to 100 percent. The remainder consists of taxes and
savings.

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TABLE 2

Import Coefficient -- Percent Distribution of Response to Question:
"Indicate What Percent of Purchases are Made in the County in which You Live,"
and Calculation of Average Percent*

Class / Percent	00	25	50	75	100	Weighted Average $(1 - M_{ik})$
Food						
Low Income	.05	.17	.12	.12	.55	.74
Middle Income	.04	.15	.08	.12	.62	.78
High Income	.08	.08	.12	.12	.60	.77
Clothing						
Low Income	.07	.24	.12	.19	.37	.64
Middle Income	.06	.19	.13	.19	.43	.68
High Income	.08	.20	.16	.28	.28	.62
Appl., Furn., and Auto						
Low Income	.15	.19	.10	.14	.42	.62
Middle Income	.15	.12	.10	.13	.49	.67
High Income	.20	.12	.08	.20	.40	.62
Other Purchases						
Low Income	.15	.20	.11	.15	.38	.60
Middle Income	.09	.18	.14	.16	.44	.67
High Income	.20	.16	.12	.28	.24	.55
Shelter						1.00

TABLE 3

C Matrix -- Probability that one Dollar Earned by Group (i) is Spent on Commodity (k) and Within County

Income Group \ Commodity Group*	1	2	3	4	5	6	7	8
Low Income	.229	.190	.056	.051	.018	.066	.018	.099
Middle Income	.179	.140	.054	.054	.034	.054	.020	.101
High Income	.108	.110	.043	.050	.028	.039	.017	.068

* See Table 1 for detailed explanation of commodity groups.

TABLE 4

Percent Income Distribution by Industry and
Value Added as a Percent of Purchases*

Commodity Group** / Income Group	1	2	3	4	5	6	7	8
Low Income	.16	.10	.16	.16	.07	.16	.12	.48
Middle Income	.61	.44	.61	.61	.45	.43	.58	.34
High Income	.23	.46	.23	.23	.48	.41	.30	.18
Value added to purchases ratio (V_k)***	.724	.666	.724	.724	.560	.681	.584	.247

* Source: Table 230, <u>Census of Population, 1960</u>, U.S. Bureau of Census.
** Commodity groups are based on two-digit SIC sectors, and correspond
as nearly as possible to the commodity classes of Tables 1, 2, and 3:
1. Retail and wholesale trade.
2. Real estate and rentals; electric, gas, water and sanitary services.
3. Retail and wholesale trade.
4. Retail and wholesale trade.
5. Finance and insurance.
6. Professional and related services.
7. Entertainment and recreation; hotels, personal and repair services (exc. auto).
8. Transportation; business and repair services.

*** Source: Table of Interindustry Transactions, 1958, <u>Survey of Current Business</u>, September, 1965, page 38.

TABLE 5

$_L$A Matrix -- Probability that one Dollar of Receipts
in Commodity Sector (k) is Paid as Earnings to
Income Group (j) and Within County

Income Group / Commodity Group	Low income	Middle Income	High Income
1. Food	.116	.442	.167
2. Shelter	.067	.293	.306
3. Furnishings	.116	.442	.167
4. Clothing	.116	.442	.167
5. Personal Insurance	.037	.252	.269
6. Personal Services	.109	.293	.279
7. Recreation	.079	.339	.175
8. Transportation	.119	.084	.045

TABLE 6

$_L$P Matrix -- Probability that a Dollar Spent by Local Income Group (i)
is Earned by Local Income Group (j)

FROM ＼ TO	Low Income	Middle Income	High Income
Low Income	.0726	.2423	.1451
Middle Income	.0631	.2073	.1227
High Income	.0452	.1506	.0913

APPENDIX B

CALCULATION OF INDIRECT IMPACTS UPON EMPLOYMENT AND UNEMPLOYMENT

The change in income in a county is taken to depend upon exogenously determined growth in local primary (ΔP) and secondary (ΔS) industry, which stimulates growth in " tertiary" industry (ΔT). This is essentially the economic base theory of regional growth, and may be expressed as follows:

(1) $\Delta Y = \Delta T + \Delta S + \Delta P$

and

(2) $\Delta T = a + b_1 \Delta S + b_2 \Delta P$

Upon substitution, equation (1) becomes:*

(3) $\Delta Y = a + (b_1 + 1) \Delta S + (b_2 + 1) \Delta P$

Using OBE** estimates of income by 1-digit SIC for 90 counties in which EDA business loans were granted, equation (3) was estimated as:

(3') $\Delta Y = 5284. + 1.8589 \Delta S + 1.2782 \Delta P$ $R^2 = .79$

          (13.28)   (6.39)

---

* Weiss, Steven J., and Edwin C. Gooding, "Estimation of Differential Employment Multiplies in a Small Regional Economy," Land Economics, Vol. XLIV, No. 2, May, 1968.

** A description of this data is to be found in Robert Graham and Edwin Coleman, "Metropolitan Area Incomes, 1929-66," Survey of Current Business, August, 1968.

The predictive power of this estimated equation is good, and the t-value of the regression coefficient for secondary industry is extremely high.

Since the EDA business loan porgram would cause a change only in secondary industry, the multiplier to be applied to the observed direct income impacts of EDA loans (ΔS) is 1.859.

The resulting estimate for ΔY was then converted into an employment dimension via the following procedure:

1. Secondary income change was subtracted from estimated total income ($\Delta Y - \Delta S$) to give total tertiary industry change (ΔT). Using a ratio of wholesale, retail, and service income to total tertiary income of .4808 (obtained from OBE estimates for the 90 counties), estimated tertiary income was split into "wholesale, retail, and service" income, and "other tertiary" income.

2. The ratios of U. S. employment to payrolls for the "wholesale, retail and service" sector for the "other tertiary" sector, and for the secondary (manufacturing) sector were obtained from 1964 County Business Patterns, U. S. Department of Commerce. These ratios were corrected for price changes (1.17) during the period 1964-1969 using annual ratios of real-to-money-GNP obtained from the Economic Report of the President, January, 1969.

The resulting ratios were further corrected to reflect rural technology by obtaining the actual employment-income coefficient observed in the 41 loan recipient firms using a simple linear regression. This coefficient.

$(.0002271; R^2 = .98)$ was divided by the national secondary sector ratio to obtain a rural productivity correction factor (1.565) which was multiplied by the two tertiary sector ratios to give:

$\frac{E}{Y}$; wholesale, retail, and service: .0002116

$\frac{E}{Y}$; other tertiary: .0001519

3. The two estimated tertiary sector income magnitudes were then multiplied by the respective employment/income ratio and summed together with actual secondary sector employment (employment in surveyed EDA financed firms since date of loan) to obtain total estimated employment change (ΔE).

(4) $\Delta E = [(.0002116)(.481) + (.0001519)(1 - .481)]\ 1.859\ \Delta S$

$= .00033577\ \Delta S$

4. Based upon a recent study of the impact of employment change upon county unemployment (CONSAD Research Corporation, for EDA, 1969), the following relation was applied to estimate the impace of employment change upon county unemployment change (ΔU):

(5) $\Delta U = (.887 - 1)\ \Delta E$

or, substituting from equation (4):

(5') $\Delta U = (.887 - 1)\ [(.0002116)(.481) + (.0001519)(1 - .481)]\ 1.859\ \Delta S$

Applying equations (4) and (5) to the estimates of total annual earnings of employees from 41 EDA-financed firms and of change in annual earnings of those employed in EDA-financed firms, two sets of unemployment change estimates based upon the multiplier process were obtained:

EDA Total Earnings

ΔS = $7,747,643

ΔE = 2,601

ΔU = 294

Change in Earnings

ΔS = $2,530,795

ΔE = 850

ΔU = 97

APPENDIX C

COMMUNITY LEADERSHIP SURVEY

Exhibit A is a copy of the Community Leader's Opinion Survey given to 100 community leaders of 40 counties where EDA loan recipient firms were located. The interview questioned leaders on job opportunities in the community, community services and facilities, and growth trends. Exhibit B is a list of the distribution of leaders by position.

Section A reports the responses of the community leaders and Section B includes an analysis by geographic area and by population growth rate.

A. Opinions of Community Leaders

The community leaders were asked if they felt that more job opportunities were available in the county now than four years ago. The majority (88) felt that there are now more job opportunities. Eight felt that job opportunities were the same and four felt that there were fewer job opportunities. Table 1 summarizes their estimates on how many companies had moved into the area or had expanded facilities in this time period. Most of the companies which had moved into the county or expanded their facilities within the county were manufacturing or construction companies.

Because of increased job opportunities most of the leaders (79%) thought that the people of the county were better off, mainly because of higher wages and more available jobs. Other reasons mentioned included

expanding industry, better housing and educational facilities and improved community services.

Table 2 summarizes the opinions of the leaders about who has done anything to improve the number of job opportunities.

Private industry, the state government and the federal government were all felt to be active in improving job opportunities. Community leaders cited the expansion of facilities creation of more jobs and job training programs, higher salaries and hiring the hard core unemployed among the activities of private industry.

The state government was credited with helping to bring in new industries and advertising for new business, in addition to sponsoring job training programs and building new highways. Activities of the Federal government which were mentioned included helping to finance local business, providing EDA loans, grants for better sewage and water systems, and poverty programs (e.g., CAP, OEO, Job Corps, Head Start).

The majority of local leaders (84%) felt that the people of the county were generally better off because of new and expanding industry, more job opportunities, and a positive business outlook. They mentioned these same reasons for expecting a continued increase in job opportunities and standard of living.

One of the questions in the survey asked whether the leaders felt that more families have moved into or out of the county in the last few years. Over 80% responded that there had been a shift of population into the county.

Reasons cited for movement into the county were better job opportunities, recreational facilities and "to get away from the city." Those community leaders in counties with a larger out migration felt that it was due to the lack of jobs and a decline in agriculture. Only 15% of the leaders felt that the size of the population in their county was not changing.

Several of the survey questions dealt with community services such as schools and police, fire and first aid squads (Table 3).

Over 70% felt that the school population of their county was growing; of those with an increasing school population, 34 reported that school facilities were adequate while 36 thought the facilities were cramped and overcrowded. 63% said that school facilities were being expanded by building new schools or adding on to current facilities. Other types of improvements mentioned included expanding the curriculum, consolidating school programs, expanding recreational facilities and building vocational schools and community colleges.

About two-thirds of the community leaders felt that civil services (police, fire, etc) for the county were expanding and most of them felt that this trend would continue because of increasing population and planned new construction of facilities. Those who thought that services would not continue to grow or would remain the same, felt that present services were adequate for the county.

Table 4 presents the community leaders' estimates of new retail business in the county.

Less than half reported that new supermarkets had moved into the county and only 24% said that the county now had additional large department stores.

More than 70% reported increased new highway construction and 63% reported improved highway maintenance in their county.

Two-thirds of the community leaders said that cultural, social and recreational facilities in the community had increased and mentioned additional parks, swimming and boating facilities, libraries and community recreation centers.

B. Analysis of Geographic Area and Population Change

Responses of community leaders to the questionnaire were analyzed by the geographic area and population change of the county.

For the first analysis four geographic areas were used to sort the survey responses for 99 community leaders. (See Table 5)

The X^2 (Chi-square) test was used to determine responses significantly influenced by geographic location. Significant results were obtained for the following survey questions:

1. Generally, as a result of the increase in job opportunities, do you think people in this area are better off, about the same or not as well off as they were previously? Most of the leaders in each area thought that people were better off. In the South, 81% of the community leaders responded this way; 80% of the leaders in the Northeast, 75% in the West and 64% in the North Central States.

2. In your opinion has the state done anything within the past four years to improve job opportunities within this county? About 73% of community leaders in the Northeast felt that the states had had a role in increasing job opportunities; 56% of the Southern leaders, 43% in the North Central region and 37% in the West.

3. Were the educational facilities adequate to handle the increased number of children attending school or did the school become cramped and overcrowded? (This question was asked only of community leaders who thought their county's school population was increasing). 50% of community leaders from the Northeast thought that their schools were adequate to handle increasing population, 43% thought that the schools were cramped and over-crowded. In the West 37% thought that schools could adequately handle the increase; 62% did not. In the South 39% did not know if schools could handle increasing population; 29% thought that they could and 29% thought that they were cramped and overcrowded. Of community leaders in the Northeast, 47% felt that schools were cramped and overcrowded, 33% thought they were adequate and 20% did not know.

In the analysis by population change, community leaders responses were sorted into quartiles according to the rate of growth or decline of population in their county (See Table 6).

Significant X^2 results were obtained for responses to the following questions:

1. Do you feel the people in this county are better off, about the same or not as well off as they were say four years ago? More of the community leaders with a rapidly declining population felt that people were now better off (96%) compared with 87% of those with a slowly declining population and 75% of those with a rapidly growing population in their county.

2. Were the increased educational facilities adequate to handle the increased number of children attending school or did the schools become cramped and overcrowded? About 48% of community leaders in counties with moderate population growth thought schools were adequate while only 25% of those with rapidly increasing population thought schools were not overcrowded.

3. Are schools expanding any of their present facilities? 80% of the community leaders of counties with net in-migration said schools were expanding facilities while only 45% of leaders in counties with net out-migration reported expansion.

4. Have civil services been increased within the past few years? In counties with rapidly declining population only 35% reported increases in police, fire and other civil services. In counties with growing populations, 74% (of those with moderate growth) and 79% (of those with rapid growth) thought these services were increasing.

5. Would you say you have more, about the same, or less adequately maintained roads in the county than you had four years ago? Over 70% of

those leaders in counties with population gains reported better road main-
tainence while only 48% of those with losses in population reported im-
proved road maintainence.

Table 1

County Growth of Job Opportunities

No. of Companies \ Activities	Companies which Moved into Area	Companies which Expanded facilities
0	5	5
1-4	37	53
5-14	23	14
15 or more	9	8
do not know	26	21

Table 2

Job Opportunities

	Improvement in Job Opportunities	Has -- Done Anything to Improve Number of Job Opportunities		
		Private Industry	State Government	Federal Government
Yes	88	83	56	71
No	12	8	31	22
Do not know	—	9	13	7

Table 3

Community Services -- Expansion

	Schools		Civil Services
	Population	Facilities	
Are Expanding	72	63	64
Are Not Expanding	25	36	32
Do Not Know	3	1	4

Table 4

New Stores

	Large Retail Food Stores	Large Dept. Stores	Other Retail Stores
Yes	47	24	33
No	49	74	62
Do Not Know	4	2	5

Table 5

Number of Community Leaders by Regions

Region	Number Surveyed	% of Total
1. Northeast	15	15
2. South	62	63
3. North Central	14	14
4. West	8	8
Total	99	100

EXHIBIT A

QUESTIONNAIRE

Table 6

Population Change

Quartile	Number of Respondents	
1	26	rapid decline
2	23	moderate decline
3	27	moderate growth
4	24	rapid growth

Int. # _____
(5-7)

Co. # _____
(8-9)

10 = rej.

Good afternoon, I'm _____ calling long distance from Philadelphia for
Chilton Research Services. We are doing a study of community leaders like yourself to
get their opinions about past and future community growth in _____ county. We
would appreciate it very much if you would give us your   (name)
thoughts on a few subjects.

Time Int. Started _____ A.M. _____ P.M.
Time Int. Ended _____ A.M. _____ P.M.

---

1. Do you feel there are more, about the same or fewer job opportunities in _____ county today than there were say four years ago?

	More	11-1
SKIP TO Q. 9	About the same	2
SKIP TO Q. 8	Fewer	3
SKIP TO Q. 9	Don't Know	V

a. (IF MORE) Why do you say that?

More companies have started operations in the past few years	12-1
Companies have expanded their facilities.	2
Other (PLEASE SPECIFY)	3
	4
	5
	7

2. As far as you know, how many companies, if any, have moved into this county in the past four years or so?

_____

IF NONE OR DK SKIP TO Q. 4

3. What do these companies do or manufacture?

#1 _____

#2 _____

#3 _____

4. As far as you know, how many companies in this county, if any, have expanded their facilities during this period of time?

_____

IF NONE OR DK SKIP TO Q. 6

5. What do these companies do or manufacture?

#1 _____

#2 _____

#3 _____

6. Generally, as a result of the increase in job opportunities, do you think people in this area are better off, about the same, or not as well off today as they were previously?

	Better off	13-1
	About the same	2
	Not as well off	3
SKIP TO Q. 9	Don't know	V

7. Why do you say that?

8. (IF FEWER JOBS ASK) Why do you feel that way?

ASK EVERYONE

9. In your opinion, has private industry done anything within the past four years to improve job opportunities within this county?

	Yes	14-1
SKIP TO Q. 10	No	2
	Don't Know	V

9a. (IF "YES") What did they do?

10. In your opinion, has the state government done anything within the past four years to improve job opportunities within this county?

	Yes	15-1
SKIP TO Q. 11	No	2
	Don't Know	V

10a. (IF "YES") What did they do?

11. In your opinion, has the Federal government done anything within the past four years to improve job opportunities within this county?

	Yes	16-1
SKIP TO Q. 12	No	2
	Don't Know	V

11a. (IF "YES") What did they do?

12. Do you feel the people in this county are better off, about the same or not as well off today as they were say four years ago?

Better off	17-1
About the same	2
Not as well off	3
Don't Know	V

13. Within the forseeable future, do you think the number of job opportunities in this county will increase, remain about the same, or decline?

	Increase	18-1
	Remain the same	2
	Decline	3
SKIP TO Q. 14	Don't Know	V

13a. Why do you say that?

14. Do you feel the standard of living for this county will increase, remain about the same or decrease within the next few years?

	Increase	19-1
	Remain the same	2
	Decrease	3
SKIP TO Q. 15	Don't Know	V

14a. Why do you feel this way?

15. Within the past few years, have more families moved into the county or have more families moved out of this county?

	More moved in	20-1
	More moved out	2
SKIP TO Q. 16	Don't Know	V

15a. What would you say are the reasons for this shift in population?

16. Now, we would like to ask you a few questions about the schools in this county. Do you feel that the number of children attending grammar school and high school has increased, remained about the same or decreased within the last few years?

	Increased	21-1
SKIP TO	Remained the same	2
	Decreased	3
Q. 17	Don't Know	. V

16a. (IF INCREASED) ASK: Were the educational facilities adequate to handle the increased number of children attending school or did the schools become cramped and overcrowded?

Adequate	22-1
Cramped and overcrowded	2
Don't know	V

17. Is the community building any new schools?

Yes	23-1
No	2
Don't know	V

18. Is the community expanding any of their present school facilities?

	Yes	24-1
	No	2
SKIP TO Q. 19	Don't know	V

18a. (IF YES) What are they doing?

19. What about services such as police, fire, medical and first aid squads. Have these services increased, remained about the same or decreased within the past four years?

	Increased	25-1
	Remained the same	2
	Decreased	3
SKIP TO Q. 20	Don't know	V

19a. Do you feel this trend will continue?

	Yes	26-1
	No	2
SKIP TO Q. 20	Don't know	V

19b. Why do you say that?

20. Do you know if any large retail food supermarkets moved into this county within the past four years?

Yes	27-1
No	2
Don't know	V

21. Do you know of any large department stores that have moved into this county within the past four years?

	Yes	28-1
	No	2
	Don't know	V

22. Have any other large retail stores moved into the county in the past 4 years?

	Yes	29-1
	No	2
	Don't know	V

23. Do you think there has been any increase in highway construction, outside of ordinary road maintenance, over the past four years?

	Yes	30-1
	No	2
	Don't know	V

24a. Would you say you have more, about the same or less adequately maintained roads in this county than you had, say four years ago.

	More	31-1
SKIP TO Q. 25	About the same	2
	Less	3
SKIP TO Q. 25	Don't know	V

24b. (IF MORE OR LESS) Why do you feel that way?

25. In this county are there more, about the same or less recreational, social and cultural facilities now than there were, say four years ago?

	More	32-1
TERMINATE	Same	2
	Less	3
TERMINATE	Don't know	V

25a. (IF MORE OR LESS)   Please give me any illustrations.

THANK YOU VERY MUCH

IT WAS A PLEASURE TALKING TO YOU

AND GETTING YOUR OPINIONS.

Respondent _____

Title _____

County _____ State _____

Co. # _____

Interviewer _____

EXHIBIT B

DISTRIBUTION OF INTERVIEWS
FOR
OPINION LEADERS PHASE

CATEGORY	TOTAL #
School (Education)	
Superintendent	6
Principal	13
President--Board of Education	1
Teacher	1
Bank (Executives)	
President	11
Vice President	3
Assistant Vice President	1
Manager	2
Banker	1
President--Savings and Loan Assoc.	1
Chamber of Commerce	
President	7
Vice President	1
Secretary	1
Business (Executives)	
President	3
Vice President, General Manager	1
Owner, Manager	1
Owner--Department Store	1
Owner--Newspaper	1
Retail Merchant	1
City/State Government	
State Senator	1
State Legislator	2
Councilman, Assemblyman	2
Mayor	10
Town Clerk	1
Law Enforcement	
Chief of Police	8
Sheriff	1
Local Organizations	
President--Lions Club	1
President--Merchants' Association	1
Director--Board of Freeholders	1
Retired President of Home Owners' Association & Presently--Aid to Library Comm.	1
Judicial	
Circuit Judge	1
President of Police Jury	1
Attorney	5

(continued)

	TOTAL #
Other	
Pastor	2
Accountant	1
Physician	2
Voluntary Fire Chief	1
Social Leader	
Total	100